

ARMED FORCES

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**SEPTEMBER
1956**

Feature

**Financial Management
of QM Inventories**

By General Hastings

On The Cover

Since becoming The Quartermaster General of the Army in 1954, Major General K. L. Hastings has conducted an intensive and continuous program to improve management and efficiency throughout the vast Quartermaster system.

More recently, with the designation of the Secretary of the Army as single manager for subsistence and for clothing and textiles for all the Armed Services, General Hastings' role has been expanded to include direct operations of these functions. Under his direction the Quartermaster Corps has adopted the most modern methods of accounting and operations, including the use of electronic devices and systems.

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For the United States Navy: the first fleet operational surface to air guided missile "Terrier," the 80-ton tradewind turboprop transport seaplane, the XFY-1 delta-wing vertical rising-and-landing "Pogo," and a study contract for naval atomic-powered aircraft.

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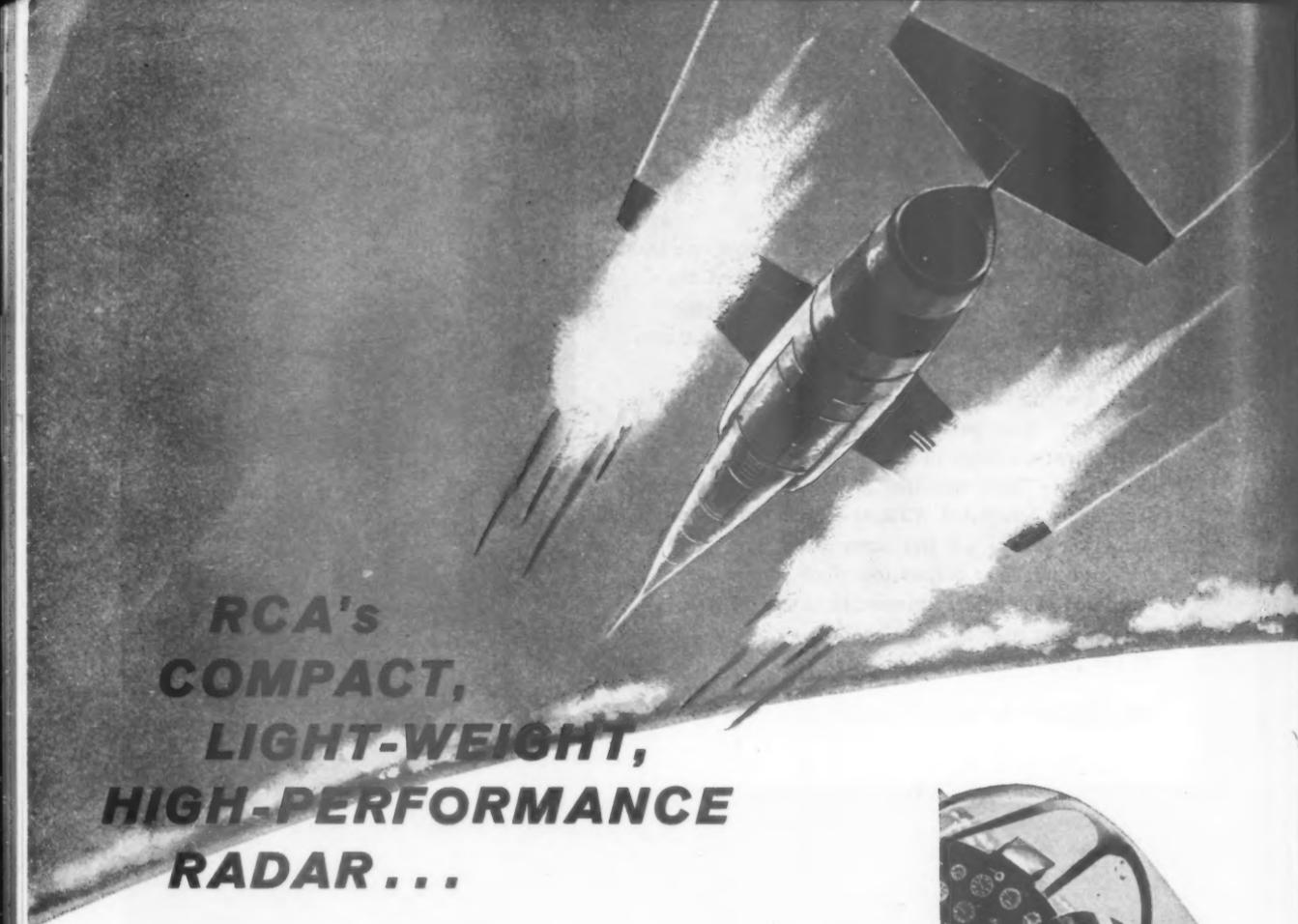
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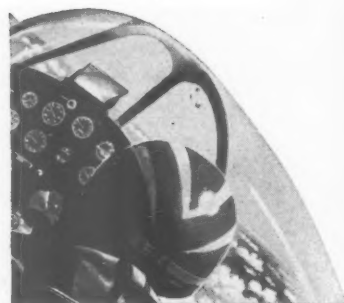
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by Major General Kester L. Hastings, USA

The Quartermaster General

Financial Management of Quartermaster Inventories

ON 16 JUNE 1956 I joined proudly with officers, enlisted men and civilian personnel of the Quartermaster Corps stationed throughout the world to acknowledge the founding of the Corps 181 years ago. The history of the Quartermaster Corps, with Major General Thomas Mifflin of Pennsylvania as the first Quartermaster General, is revealed in the history of our growth as a great Nation and in that of the American Army which has served the Nation successfully in war and in peace.

Since the days when General George Washington looked to his first Quartermaster General to provide certain items of camp equipment and transportation for his Army, Quartermaster Generals have been assigned supply and service responsibilities which matched the requirements of each era in the changing concepts of the Army. Today, after 181 years, our Army is prepared to defend the Nation with all the weapons and equipment, including food, clothing, and petroleum products, that scientific research, American industry, and technically trained military and civilian personnel have made the best in the world.

As Quartermaster General of the Army, my prime responsibility is that of supplying the soldier with the best food, clothing, petroleum products, tentage, equipment and services that will support him during warfare, or in training for combat, wherever he may be stationed

in the world. The areas in my mission can be generally pictured by referring to Figure I titled "The Quartermaster General's Mission Areas." The supplies which the soldier requires and the services which maintain his fitness are many. In this modern day the inventory value of these Quartermaster supplies amounts to over \$2.5 billion. Our world-wide Financial Inventory Accounting Reports for 31 March 1956 indicate that Quartermaster clothing and equipment is valued at over \$1.8 billion; petroleum, oil and lubricants at over \$121 million; general supplies over \$333 million, and subsistence over \$224 million. These supplies number over 100,000 different items and are gathered into 110 categories for analysis and management. As a point of further interest, it should be noted that although, for instance, the value of subsistence inventory as of 31 March is shown to be \$224 million, this figure does not reflect the financial management involved in a turnover of over \$600 million in subsistence annually. It is significant that the smaller inventory reported indicates a purposeful financial management of the much greater value of subsistence supplies annually consumed.

I fully recognize the enormous cost of the National Defense and the responsibilities of military leaders for stretching the dollars invested by the taxpayer to the greatest possible extent. To do this, there must be supply economy and expert management of resources.

The Quartermaster General's Mission Areas

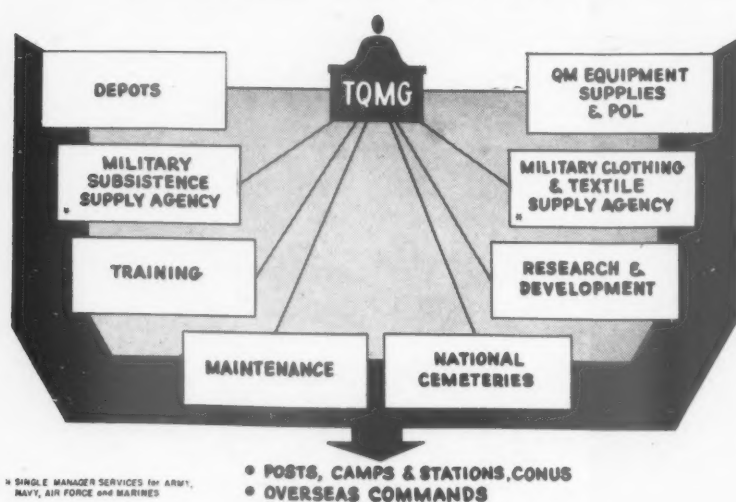


Figure 1

These receive daily attention, for my concern that the soldier must receive the Quartermaster services and supplies that will keep him the best fighting man in the world is coupled with the knowledge that he must receive them when he needs them, in the quantity necessary, wherever he is, without waste of time, supplies or effort.

The financial management of a multibillion dollar inventory, whether in industry or the armed forces, has been found to require, as a minimum, these several essential elements. First, there must be a statement of policy to indicate what is to be the goal. There should then be a system within which financial management can function successfully, with checks and balances, and controls, with speedy data forwarded to decision makers from bottom to top management, and speedy communication for action up and down the line. Third, there must be a careful selection of dedicated inventory managers who are thoroughly trained to perform the lesser as well as the more complex duties which make up the total. In the Quartermaster Corps we basically have these essential elements. Our foundation is built upon the sound guidance we have received in the Army's Financial Management Plan. Our continuing efforts are applied to currently performing efficient financial management of our inventories while, at the same time, finding and using better ways

and means to improve what we are now doing.

Perhaps financial management requires some clarification. The phrase "financial management" seems to imply that we are doing something new and different to our Quartermaster supplies. In actual fact, the supplies are improved versions of the same food, clothing and equipment, and petroleum items that we have handled for many years. Financial management reduces the items to their dollar value for management on a dollar basis. Just as the family budget is measured in dollars for shoes, food and furniture, the Army's shoes, subsistence, and equipment can be budgeted and controlled and measured in dollars. The introduction of this technique into all inventory management areas establishes common ground for usage throughout the Army, the Department of Defense, and the Congress of the United States.

Financial inventory accounting and the Army stock fund are two important segments of the Army's Financial Management Program. These are the major tools for financial management of Quartermaster inventories. We utilize as well other financial management tools such as consumption funds, industrial funds, integrated accounting, and performance budgeting. In general, however, the Quartermaster Division of the Army Stock Fund and Financial Inventory Account-

ing are emphasized in my further discussion.

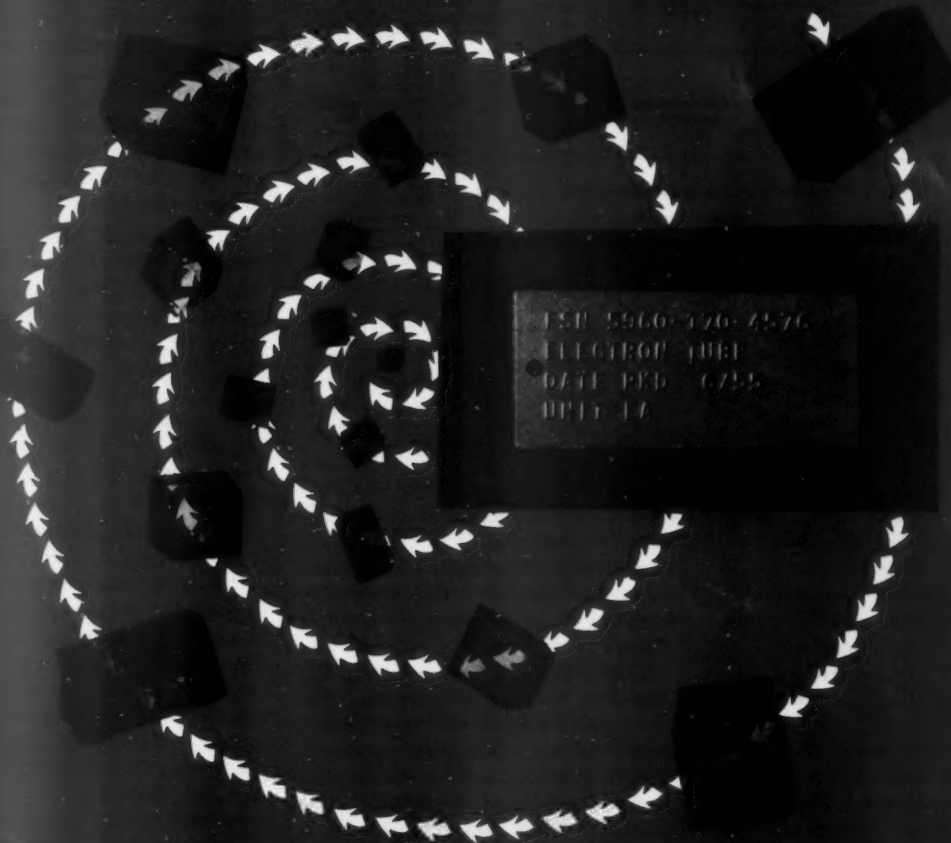
Before going further, I will distinguish between financial inventory accounting and the Army stock fund. Financial inventory accounting is the simpler and more prevalent of the two systems. It means the reduction of all of our inventories and supply transactions to dollars and the accumulation of these dollars in inventory subdivisions or categories, as well as by purpose. Since we already had an elaborate formal perpetual item inventory record at all depots and stations and a published standard price for most items, it involved bringing the two together. The millions of transactions and the many thousands of different items which exist in our Quartermaster supply system were reduced to a single common denominator, the dollar. We then had a quantitative item as well as a dollar inventory.

The stock fund is more complex in that cash is added to the inventory and a revolving or working capital fund created. With this fund, an issue becomes a sale and a delivery from a vendor a purchase or investment in inventory. Since we must keep items on hand for future demand, we sell them at replacement cost. If the coffee we have in our stock fund in our warehouse and in post commissaries was purchased at 50 cents a pound, and the market price goes up to a dollar a pound, we must sell the stock on hand at a dollar in order to be able to replace that pound of coffee. A comparison of these two systems is shown in Figure 2. In summary, the stock fund consists of all the supplies in our warehouses plus cash to replace the items sold. This revolving fund is depicted in Figure 3.

An understanding of these two systems—stock fund and financial inventory accounting—troubled many people at the outset. Fortunately, the two are now sufficiently compatible in our operations to be considered virtually the same. The Quartermaster stock fund includes authorized stockage of items of subsistence, petroleum products, clothing and equipage, and general supplies. Financial inventory accounting includes these same items plus the materials handling equip-

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Accounting Developments Around the Quartermaster Supply Pipeline

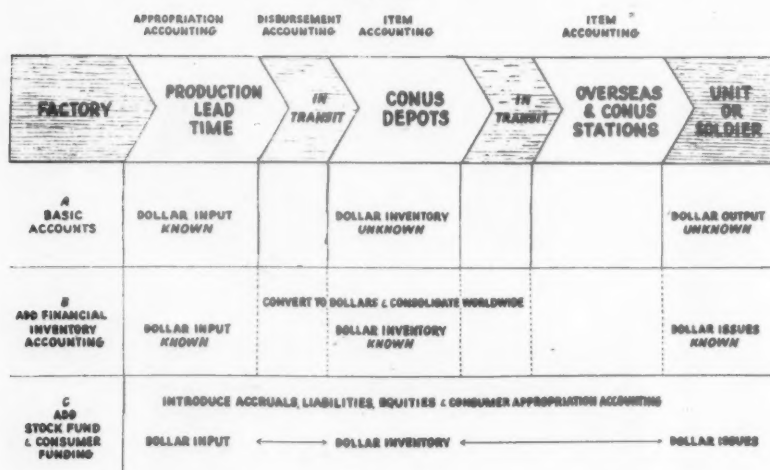


Figure 2

ment, special purpose vehicles, and special purpose equipment items financed by the Procurement and Production Appropriation which make up only about 3% of our total Quartermaster item inventories. In this respect we differ considerably from the Ordnance or Engineer Corps whose principal items of supply are considered capital equipment of the combat force type financed by P & PA and excluded from the stock fund. Because of this basic difference, the points I make about the application of these financial devices are not necessarily the same as for these other services.

Since "Financial Management" has helped the Quartermaster Corps better manage its inventories, I will sort out the special advantages as I see them.

Advantages of the Financial Inventory Management—Real and Implied.

A. Measurement of Inventory—The first and basic function of the financial inventory plan is the measurement of inventory and supply transactions in terms of dollars. Not only the inventories, which exist at any one time, but the related receipts, issues, and adjustments are converted into the simple common denominator, the dollar. By this means, the value of the many thousands of diverse items which we provide the armed forces are equated and considered together. Measurement of the dollar issue rate provides a ready

means of calibrating the magnitude or turnover rate of the total inventory. Comparison of receipts to issues provides definite confirmation of how the over-all supply operation is moving. All of these things are not only interesting but essential to my principal supply officers.

This information is not equally useful to all supply people. It is of no particular interest to the unit supply officer who must secure a certain kind of tent, nor to the individual who must supply him with that tent. The man who wants a size 8-E boot is concerned with the value of that boot but not with the dollar total of all the clothing and equipment inventory. The storage officer, no doubt, is more concerned with weight and girth of the items. But we must have specific detailed information about the requirements for and the availability of each of

the many scores of thousands of items which we supply the Army. The demand for our total supplies is the separate sum of many different individual demands with limited possibilities for substitution. A shoe is a shoe and a C-ration is a C-ration and they are as distinctly separate as anything can be. But put these facts together both quantitatively and in dollar value, and a big picture presents itself which is realistic and can be examined to see where we are going on an over-all basis.

To my mind, this is the most useful aspect of financial inventory devices. This characteristic is shared, of course, by both financial inventory accounting and the stock fund. It simply provides us with both a unit of measure and a set of dials or gauges with which we can perceive broad inventory movements and take necessary management actions.

B. Facilitates Procurement —A basic advantage of the stock fund is the more flexible financing which is provided for procurement. This claim is rooted in the revolving fund theory that investment in inventory can proceed at a more efficient and convenient rate than under conventional appropriation financing. On the face of it, the rate of inventory investment is separated from the consuming appropriations by the amount of cash and credit available to the stock fund. Perhaps more important, the revolving fund appears to escape the problem of fund lapsing with its concurrent incentive for year end procurement requirements.

The extent of this flexibility is limited a great deal, however, by

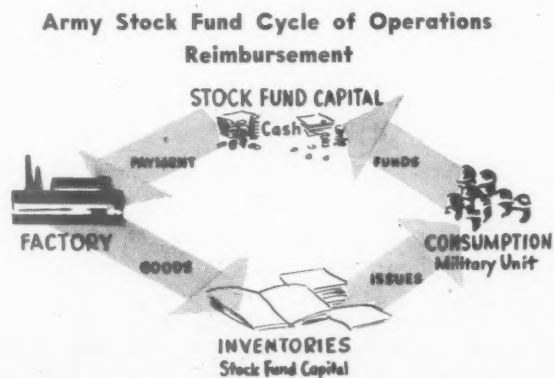


Figure 3

Quartermaster Inventory Control Center

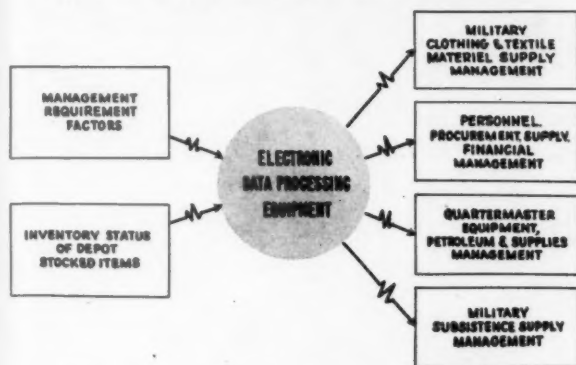


Figure 4

Utilization of Electronic Data Processing

the fact that the stock fund is permitted to revolve only at the closely controlled rate approved by the Bureau of the Budget. In other words, theoretically our stock fund is deposited in a blocked bank account which can be withdrawn and spent only as approved by the Bureau of the Budget through the apportionment process. The authority to obligate is made available through a conventional allocation different only in that it is currently available for a whole year rather than quarterly. This authority to spend "lapses" at the end of a fiscal year and acts in the same manner as do the annual appropriations. Some of the aspects of this "advantage" require closer scrutiny.

I believe that the apportionment control could be removed with some beneficial results as it does limit to a degree the flexibility which a manager of a revolving fund should have.

C. Improves Consumption Budgeting—Probably the principal reason for creating the stock fund device for inventory financing was the fact that it permitted the development of a budget based upon what is used or consumed rather than what is spent for inventory. For years, the Congress had been advised not as to what the services were actually costing, but rather what they were investing in inventory. There can be significant differences in the amount purchased for inventory and the amount issued for use. During fiscal year 1955, for example, in the Clothing and Equipment Subdivision of the Quartermaster Division of Army

Stock Fund, we issued (or resold) supplies valued over \$250 million while only about \$75 million were replaced. Thus, we liquidated \$175 million more than was invested in new inventory. The consuming appropriations are properly charged for what is used. If, as in this example, we had an excess inventory in the pipeline which did not require replacement, we have liquidated \$175 million in inventory assets and turned inventory into cash which was excess to our authorized procurement requirements. In this way, the Quartermaster Division of the Army Stock Fund was able to return, in the past three years, over \$1 billion in excess cash to the Secretary of the Army.

This aspect of the stock fund is an important one for a better financial management of the Army. It may be sufficient reason by itself to justify the stock fund.

D. Facilitates Cross-servicing—Because the stock fund "sells" at the end of the pipeline (i.e., depot or station level), it provides a ready and convenient means for orderly reimbursement for transfer of supplies to one of the other armed services. With far less confusion than the laborious transfer of supply documents to Washington which accompanied earlier cross-servicing, supplies can be "sold" to another service at overseas depots, CONUS stations, or at CONUS depot level for reimbursement at that point. The stock fund is as well able to serve the Air Force or Navy customer as it is an Army one.

With current emphasis on cross-

servicing of common supplies and the new single manager programs, this advantage has come to have real meaning. The current single manager assignments have charged the Quartermaster Corps with new and increased responsibilities in subsistence and clothing and textile materials. These assignments are built around the stock funds for these commodities. With these funds, the Army can provide supplies as easily to the Air Force, Marines, Navy and Coast Guard as it can to the Army and the National Guard. Our experience with the stock fund has helped the Quartermaster Corps assume its new defense-wide supply responsibilities.

E. Facilitates Resale—Just as it helps in handling the sale to another military service, so the stock fund facilitates the resale of supplies to individuals. Much more than the other technical services, we in the Quartermaster Corps provide supplies for cash resale to authorized individuals in the military establishment. Our subsistence commissary sales, personal uniform clothing item sales, and overseas petroleum sales involve well over \$100 million annually in cash transactions. This total is, in itself, big business.

The stock fund has simplified the problem where it has been extended to commissary level. It might be added that station subsistence accounts (commissary) have been under a formal dollar single entry accounting system long before initiation of the stock fund or financial inventory accounting. The stock fund definitely facilitates the handling of resale transactions.

F. Eliminates Claimants—By charging the customer military service appropriation, or authorized individual, when supplies are issued from the pipeline, the inventory management problem of segregation by ownership is eliminated. Formerly, inventories were purchased with funds related to a certain service or purpose. The inventory "belonged" to that service and had to be segregated from that intended for another services or purposes. There was not one pipeline of, let us say, helmets, but rather a separate one for Army

(Continued on page 45)



Lockheed scientists are designing

WINGS FOR THE ATOM

Domesticating the atom to serve mankind has intrigued science for over a decade. One top priority application, secretly under way for several years at Lockheed: developing a nuclear-powered plane as different from present types as a supersonic jet is from the first stick-and-wire biplane.

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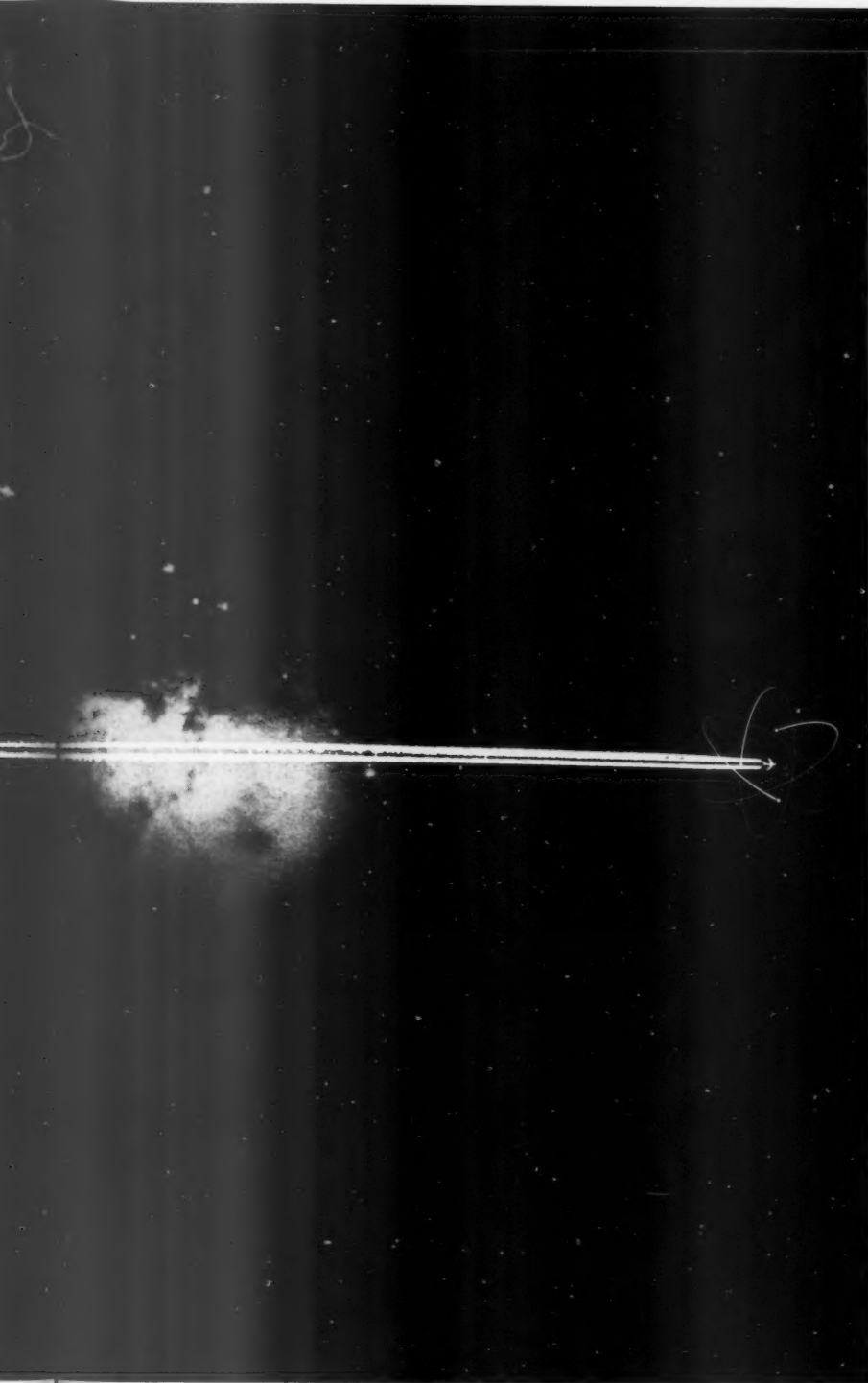
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What Management Means to Me—

This Month:

By Col. Inez Haynes, ANC
Chief, Army Nurse Corps



Probably no other profession is undergoing so dynamic a reconsideration of itself and its role as Nursing. To the Nurse Administrator in the Army attention must be concentrated on the question of how Nursing service can be made quantitatively and qualitatively adequate to meet the ever increasing demands placed upon it. To the writer, management acknowledges the part which Nursing should play in planning for the improvement of total care of the patient.

In the hospital, the administrative and professional staff are anxious that a good job is done with reference to more or less definite ideals and high standards of practice. Beyond that they have a natural self-interest to be concerned about sufficiency of incomes, security of their tenure of employment, and their status at work in point of recognition, commendation, and advancement. As Nurses, we frequently tend naturally to think of our role in institutional connections from the standpoint of satisfactions and benefits which we may personally seek and expect. There is no reason why this should not be so. But to acknowledge it is to realize that, because of the different occupational personal factors, and interests in any organization, there has to be a conscious explicit effort to transcend special interests in favor of organization unity.

Today's Nurse Administrator is concerned with the reorientation of professional practice in order to provide patient-centered care to the sick. She is constantly seeking effective tools to evaluate Nursing care standards as a means to reaching this goal. With the rotation of assignments, changes and preparation of her staff, the Nurse Administrator must place great emphasis on the proper utilization of all nursing service personnel assigned. This means that the professional nurse should be working at the highest possible level in the most efficient manner with the best possible tools. With this in mind the need for nurse participation in research, staff studies, evaluation of labor-saving devices, review of Nursing methods and planning must be continuous in a Nursing service, if we are to improve patient care.

Since mid-century the Army Medical Service has recognized the important role of scientific management in Nursing. In Army hospitals, the nursing service has been reorganized along with the other hospital departments to provide for simplicity and maximum effectiveness in administration and utilization of all personnel and facilities. A management program has been imple-

mented in the hospitals with the primary objective of studying and analyzing its problems, increasing job satisfaction of employees through better understanding, in-service education, and development of personal potential. This means that advancement should definitely serve all the associated individuals and their common objective: rendering the highest quality of care to the sick.

In her role as Administrator of the Nursing Service, The Chief Nurse will need to have a tested method of achieving this mission constantly before her—both in organizing to act and in leading and supervising the activities of the actors. It is imperative that an Administrator understand the fundamental principles of scientific management as applied to Nursing. The Nurse Administrator must know herself. Only through self-evaluation and understanding of her own capabilities and limitations can she interpret the factors underlying the motivation and behavior of others. As a Nurse she must know and practice the art of positive leadership within the organization—by setting the pace and creating an atmosphere where mutual confidence exists between supervisors and the supervised. In essence, it's the idea that all are working for the same end and will share in the results. Upon arrival in an organization, she will rarely find the atmosphere pure. It is mixed and the essential differences are between the amounts of internal and external control. She will need to meet with her staff and organize its activities by formulating a set of objectives. In Nursing as well as any other organization there must exist a certain unity of purpose if the Nursing staff is to be able to work toward the stated goals. Each member of the Nursing service should be given the responsibility of doing his or her job practically as she or he thinks best, once a selected method has been established for the activity. In a Nursing service equal division of responsibility should exist. Members of the Nursing service should be taught by and receive the most friendly help from those who supervise instead of being at one extreme, driven or coerced by the "boss supervisor" and the other left to his or her own unaided devices.

Effective management as applied to Nursing fundamentally consists of certain broad general principles and a philosophy which can be applied in many ways. The writer does not claim that any single panacea exists for all the problems in administration of the Nursing

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service or personnel. No system of management yet devised, or single expedient within the control of any one individual or one group can insure continuous happiness and success if applied to all organizations. Nursing history indicates that the ingenuity of each decade has developed improved methods for ascertaining safe practices of rendering Nursing care to the sick. Further there is hardly any element of any profession where there is complete uniformity of methodology. In planning and implementing a program for evaluating Nursing service a thorough orientation of all participants is necessary. Any changes must be brought about gradually as the process involves a change in mental attitudes on the part of many which demands time and it is impossible to hurry beyond its speed. Every member of the organization must fully understand the program and believe in its principles. We must not overlook the most important party—the total patient as the consumer of the product whose rights are greater than those of the Nurse Administrator and her staff. Good management in Nursing does not involve a major revolution nor the discovery of unusual or startling facts—it does involve a combination of elements which should stimulate each participant to harmonious cooperation and do his or her best to achieve the clearly defined goals.

Through management research, studies of the Nursing Service in Army hospitals, the findings indicate a system which would: effect improved utilization of Nursing Service personnel, permit measurement of Nursing service requirements, and, promote standardization in the organization of Nursing units.

Personnel Factors Considered

In measuring Nursing service personnel requirements the following factors are considered: the number of occupied beds; number of hospital wards open; number and types of patients on each ward; length of patients' stay in the hospital; physical plant; workloads in the operating room, obstetrical service, nursery; number and types of clinics in operation; amount and types of supervision and teaching needed; amount and type of activities by Nursing service; amount of Nursing effort required for type of patient admitted; a system of classification of patients was evolved which demonstrates a patient's requirement for Nursing service based on the following factors: Nursing procedural requirements, physical restrictions, emotional factors and instructional needs. This approach has reflected nursing care requirements rather than degree of illness or diagnosis which was brought out in the work generated by the doctor and head nurse. These findings support the logic that nursing which functions at the bedside of the patient for the 24-hour period should contribute from its intimate knowledge and specialized preparation so that standards of patient care can be maintained and enhanced. This method is presented to point up the relationship of all factors in a given Nursing situation, the need for good working relations and deliberation, if evaluation is to be a continuing process.

The Nursing service must re-examine its objectives and program content periodically to encourage the growth of human associations. For instance: in the light of our objectives—*where* do we stand today? *What* do we need to do now? and *how* shall we proceed? It is not so much what is being done as it is how *that* con-

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tributes to the major aim which has to be considered in effective management of a Nursing Service. Another important factor is how to make the appeal of Nursing Service persuasive and controlling in the life of the oncoming generation in the face of uncertainties, insecurities and conflicts which the total social situation of our day presents. There is a need for greater attention and clarification on the part of those of us who have been given the responsibility of organizing, operating and/or managing a Nursing service to study this factor in the climate of our times. Nursing as a profession has a pearl of great price which it should sell to others to possess and share. Ordway Tead says there is a faith at the heart of devotion, of sacrifice, and of victory. It is only as that faith has possession of the leaders in Nursing that works of value can result. Managerial success depends upon sharing knowledge and responsibility in an organization, where methods are understood and agreed to, individual potentialities are enhanced and goals are being realized and shared. This means that a Nurse Administrator who carries out the principles of effective management will heed a program which includes a cooperative review of total performance, leadership and methods, if nursing care is to be properly evaluated and improved.

September Anniversaries

Army Corps of Military Police	26 Sept 1941
Department of the Air Force	Sept 1941



Use of Manpower Resources In the Air Materiel Command

By Major General Paul E. Ruestow, USAF

THE SOLE mission of the Air Materiel Command, logistics arm of the United States Air Force, is to keep the fighting units supplied with the quality and quantity of airplanes, weapons, and related equipment necessary to our effective defense in the skies. In the event of war, the Air Materiel Command will be responsible for seeing that the airplanes which comprise our strategic striking force, our air defense forces and our tactical air forces are ready to go. To meet these responsibilities, the Air Materiel Command must work arm in arm with the combat air commands, in the Zone of Interior and overseas, with American industry and with the other military services.

Involved in the prosecution of the AMC mission are billions of dollars, thousands of airplanes, some of the most complex equipment in the world, and 1,200,000 different kinds of supply items. Behind each operation in this vital logistics system stands a small army of people—men and women, Americans and foreign nationals, who



Director of Personnel & Support Operations,
Headquarters, Air Materiel Command

are the key to improved management and operations.

Perhaps somewhat surprisingly, this vital component of our air arm is manned primarily with civilian employees. Although the Air Materiel Command is an integral part of the Armed Forces, the civilians outnumber the military by a ratio of 6 to 1. There are approximately 194,000 civilian personnel employed by the Command, located for the most part on 24 major air

bases and depots throughout the world. The number of civilian employees at each of these locations ranges from a few hundred at the smallest stations to over 20,000 at Kelly Air Force Base in San Antonio, Texas, and Tinker Air Force Base in Oklahoma City, Oklahoma. The AMC bases located overseas, which are in direct logistical support of the Air Force theatre commanders, have in their employ large numbers of foreign national personnel as well as U. S. citizen civilian personnel. Helping us in our global logistics effort are citizens of England, Germany, France, Spain, Japan, Okinawa, the Philippines, and the Arab areas of North Africa.

While the military occupy, as would be expected, the very highest level positions within the organization, the majority of both technical and administrative jobs are staffed by civilian employees. There is, in fact, a democratic mixture of civilian with military, and civilian officials occupy many key positions in the chain of command. Generally speaking, the chief criterion for position occupancy in the Air Materiel Command is the ability and experience of the incumbent and not the military uniform or lack of it.

A wide variety of occupational skills is utilized within the Command. To mention only a few, there are aircraft mechanics, electronic equipment repairers, warehouseman, property and supply officers, contracting officers, buyers, price analysts, aeronautical engineers, electronic engineers, plumbers, clerk-typists, storekeepers, supply catalogers, draftsmen, accountants, architects, aircraft jet engine mechanics, aircraft hydraulic mechanics, carpenters, patrolmen, janitors and administrative officers.

In view of the size of the organization, the complexity and variety of its work, and the crucial importance of its mission, it is understandable that the Air Materiel Command should place considerable emphasis on its civilian personnel program. Within this program, greatest stress is placed on maximizing the utilization of skills and strengthening the esprit de corps of the civilian group. Basi-

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cally, a two-fold approach is made to the matter of civilian manpower utilization: In the first place, sustained efforts are made to introduce into the system personnel of uncommonly high potential, and secondly, every reasonable method is employed to insure best utilization of individual skills on the job.

Until recent years, it was the practice of many of our supervisors to give disproportionate weight to the seniority principle in selecting people to fill positions. This practice, of course, did have some advantages. Thus, a senior employee normally had a real stake or interest in the goals of the organization. Moreover, even employees possessing the most mediocre intelligence and aptitude would generally acquire some very useful knowledges and seasoning by virtue of long exposure to the problems of the organization. However, more often than not, the emphasis given the seniority factor resulted in the advancement of mediocre talents throughout the organizational hierarchy.

For a number of years now in AMC, personnel selection in general, and selection of personnel for key supervisory, management and technical positions in particular, has been based on specific personnel selection standards. These are, for the most part, in excess of the minimum qualifications standards prescribed by the Civil Service Commission for all similar positions in the Federal Service. Our standards include minimum scores on tests such as the Learning Ability Test, educational attainments and previous job performance. Previous job performance is gauged primarily from scaled point ratings made by previous supervisors. Normally, these ratings include an assessment of such personality traits as attitudes displayed toward employees and co-workers, perseverance in the face of difficulties, and adaptability to new situations.

General E. W. Rawlings, the AMC Commander, has frequently stated that the AMC employee is the AMC's most important single resource. It is on this account that we have attached such importance to the development of our supervisory force—for it is through this force that most will be done or

undone in the utilization of human skills and abilities. Prospective supervisors must qualify on the Civilian Supervisor Selection Battery of tests including the all-important supervisory judgment section. This section of the supervisor test battery measures the several personality traits generally conceded to be desirable in supervisory personnel. In addition, the Supervisor Selection Battery is considered to be a good measure of intelligence in view of a high correlation between scores on this test and intelligence test scores.

A brief reference has been made to the fact that assignment to any civilian position is contingent on the successful meeting of minimum qualifications standards—mainly experience and training—prescribed by the Civil Service Commission. As a matter of fact, many of these standards are developed by panels of experts within the Federal agencies, under the general supervision of the Civil Service Commission. This is so especially in those occupational areas peculiar to a given agency. Thus, it is most reasonable and appropriate that the basic qualifications standards development work for aircraft positions (such as aircraft hydraulic mechanic) should be accomplished within the Air Materiel Command with the assistance and final approval of representatives of the Civil Service Commission. Thus, the AMC does have a basic responsibility for developing appropriate qualifications standards, especially for a great variety of positions more or less peculiar to the Command.

It has been customary for qualifications standards to be developed by the pooling of the experiences and knowledges of a group of experts in a given occupational area. For example, a group of senior procurement officials might convene as a panel to determine and recommend minimum experience and training requirements for positions in the Contracting Officer series. Considerable experience is brought to bear in this process, and, by and large, the standards developed have resulted in the selection of reasonably well qualified personnel.

At best, however, this process of standards development is a subjective one, and we in the AMC have

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believed for some time that much greater objectivity is needed. We would like to be in a position to say with some real assurance that persons meeting certain minimum standards are likely to be successful on the job, based on statistical evidence of the fact. With this in mind, we have experimented in recent months with qualifications data in the Price Analyst position series. As result of a scaled rating process we have isolated from among the incumbents of these positions a number of persons who are performing their jobs in a better than satisfactory manner. Beyond this, we are attempting to determine those common personal attributes which appear to be predictive of high quality job performance. This is an area of work which is relatively new to us and probably to the personnel profession in general. Nonetheless, the need for greater objectivity in personnel selection justifies fully, in our opinion, further explorations in these directions.

(Continued on page 46)

A POPULAR song of World War I vintage asked the catchy question, "How Ya Gonna Keep 'Em Down on the Farm, After They've Seen Paree?" It recounted the problem of American farm parents in attempting to make the rural homestead attractive to their sons who had been exposed to the exciting charm of the French capital as members of the American Expeditionary Forces. People who hire and manage research personnel might commiserate with the aforementioned parents to the extent that their research talent often enters the industrial research laboratory after having been exposed to the charms of the university with its stately traditions, its quiet, tree-lined campus, and its relatively unhurried faculty which, in theory at least, is free to follow its research bent with a minimum of outside interference and pressure—not to mention some three months of annual vacation time.

The contract between such university research settings and that of the customary industrial research organization, which, in most cases, is forced to gear itself to the practical necessities of industrial production and industrial organization, is obvious. Research students, steeped in university atmosphere, may tend to recall their relatively carefree days at alma mater with fond longing when they find themselves part of the day-to-day operation of an industrial research team. Since graduation from a technical school is more and more a prerequisite for industrial research, only those who are adapted to a university program and its academic orientation are able to graduate, and thus enter the zone of consideration for selection for an industrial research position.

In his brief career to date, "Bill Wharton," a recent science graduate, illustrates many of the problems the newcomer to industrial research faces in making the transition from campus to industrial laboratory. By dint of great effort,



How Ya Gonna Keep 'Em Down in the Lab?

By Robert F. Pearse, Ph.D.

*Executive Vice President,
Worthington Associates, Inc.*

Locating and Developing the Researcher*

aided by a few minor miracles, and with the assistance of parents and in-laws at strategic points, Bill wound up his five year undergraduate program with: two science degrees at the Bachelor's level; a wife and one and one-half children; a year or so as an instructor at his alma mater; and a reputation for being forthright and intelligently aggressive in campus affairs.

Eagerly sought after by more than the usual number of industrial organizations because of his outstanding campus record, Bill finally narrowed his choice to three. "Atomic Reactors, Incorporated" wanted Bill to join their group that was preparing to build and set up a reactor plant. After checking with friends in previous graduating classes, Bill decided that, despite being in on the ground floor of nuclear industry, he might become merely a specialist in building reactor installations, and hence automatically limited in the scope of his career. "Amalgamated Electric Corporation" did their best to persuade Bill to come into their two year student trainee program. After five

years of undergraduate science training, he balked at the idea of being a "trainee" for two long years, despite the company's position in the industry and the diversity of the work it offered.

He finally decided to accept the offer of the "Davis-Williams Company," who assured him that he could start right in as a member of a basic research team, which he wanted. Though their monetary benefits were less than that offered by "Amalgamated," Bill liked the idea of doing research. Also, he was impressed by the warm and genuinely friendly efforts that were made to help him and his wife, Amy, locate in their new surroundings. After a year on this job, Bill decided to return to the university for a graduate degree. He felt he needed the additional training to go as far in the research field as he hoped to go. Rather than showing bitter recriminations at his decision, "Davis-Williams" gave him a leave of absence and went all out to help him get a fellowship at his school. Bill is now back at the university in teaching, which

*Adapted from a paper presented at Columbia University's Sixth Annual Conference on Industrial Research, Arden House, New York, June 1955, and published by permission of the university.

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he dearly loves. But the friendships and congenial atmosphere which he encountered at "Davis-Williams" are strong forces which incline him toward thinking of returning to them after he completes his program.

Bill's entry into industrial research, and his later decision to return to school for advanced scientific training illustrate many of the problems which face those who are responsible for locating and developing researchers in industry today. Those who must fill recruiting quotas in today's shortage of scientists are primarily concerned with getting and holding onto enough people to keep the organization's research efforts going. However, mass hiring can lead only to mass turnover—unless the company thinks about each candidate as an individual and does its best to give him the opportunity and work satisfactions that are most meaningful to him.

Why Should They Stay?

FORTUNE magazine in a recent article concerning young scientists, their ambitions and their attitudes, infers that the most able young scientists in a number of fields do not go into industry. According to the article, a principle deterrent to industrial employment was the limitations placed on scientists' freedom to work on research of personal interest to them. Another objection was to the restrictions placed on the right to publish findings in technical journals, and to present papers on their work at professional meetings. In two nationally known industrial laboratories where such restrictions were negligible, industrial scientists surveyed said that they preferred industrial to university research in many ways.

One of the great, central, overwhelming facts that must be recognized by those who locate and develop researchers is that **RESEARCHERS ARE PEOPLE**. They have hopes, ambitions, disappointments, loves, hates, disgusts, frustrations — the entire gamut of emotions that their non-scientist fellow humans have. In answer to an Incomplete Sentence Series question, "When it comes to seeing things . . .", "Gordon Flem-

ming," a talented researcher responded, "... look out for flying saucers." A personal counseling interview with Gordon revealed that his hysteric and depressed wife was throwing saucers, and pots, and pans around the house when he returned from an arduous day at his company's research unit. Needless to say, such an emotional situation did not make Gordon's day on the job any easier. "Neil Hawkins," a Ph.D. and well known research scientist, worries about his wife's severe eye affliction. Helpless to give her other than money which he earns from his scientific specialization, "Neil" is seriously troubled by her ailment. His concern likewise affects his performance.

Some Ways in Which Personality Can Influence Research Performance

Lawrence Kubie, the noted psychoanalyst, has recently written a profound and stimulating article entitled, "Some Unsolved Problems of the Scientific Career." In it he discusses a number of cases, presumably based on his experience as a psychoanalyst which document the manner in which unconscious factors have influenced individual performance in scientific careers. Unconscious attitudes are not always detrimental, of course. If a researcher in his scientific endeavors is symbolically looking for answers to personal problems which he has externalized and projected out onto his material environment, the emotional force with which he pursues his substitute search may make him work harder and produce more. For each individual scientist, personality factors may be seen operating in the methods he employs and in the type of research he undertakes.

The Armour Research Foundation has recently published an article on their use of projective techniques for assessing the personality characteristics of research scientists on their staff. Dr. Anne Roe, in her book, "The Making of a Scientist," discusses relationships between personality and scientific performance. In our own work with projective techniques in assessing scientists and technical people for industry, we have encountered many cases in

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which unconscious personality factors seem to influence work performance.

"Frank Lake," a nationally known researcher, has a deep underlying need to make sure the company he works for values him as a person, and to test out colleagues to see if they will accept him despite his occasional unorthodox behavior. Frank continually evaluates the company's feeling toward him, and thinks about moving to another organization the moment he suspects they might not really appreciate him. In like vein, he occasionally indulges in bits of out-of-character behavior that sometimes puzzle and perturb his more conventional and conservative associates. Since he does not understand how his inner feelings influence his behavior in these two respects, he is something of a lonely "lone wolf," a man who expends needless energy in "being himself," without becoming more efficient because of it.

"Harvey Cook" pushes so hard to get top results in his own department of a large research division that he has difficulty in fitting into the coordinated needs of the larger corporate framework. In divisional conferences, Harvey is loath to stand on his feet and justify his demands before his colleagues. Consequently, he compromises, and leaves the meeting chagrined and resentful over not having gotten what he wanted. His personality needs are of the sort that will make him more effective running his own independent organization than when trying to pull together on a teamwork basis in large scale research.

"Walter Parsons," an able researcher forges ahead in a rational, impersonal, drivingly results-oriented manner until he hits a block involving other people's failure to perform. Concerned about his own rising hostility and impatience when this happens, he often finds excuses to adjourn planning or discussion conferences until he can get his temper safely under control. He is embarrassed at the thought of his own aggressive feelings coming so close to the surface. During the hay fever season, he sometimes has to go home for a day or two, as his hay fever symp-

toms mount in proportion to his aggressions.

"Jack Willard," a veritable intellectual giant in the industrial research field, has a need to exercise his intellectual capacities by devising ways of making ordinary research assignments sufficiently challenging to stimulate his mental horsepower. With an almost boyish sense of humor, he sometimes delights in leading his superiors a merry intellectual chase, playing a complex sort of chess game with the men above. In this, he takes keen delight in anticipating their moves as they work problems through together. For ordinary mortals, his abilities and his swiftness are a bit frightening. Unless supervisors recognize his unique talents, and learn to accent his style, they may have difficult moments in attempting to collaborate with him.

Each of the above researchers has a particular pattern of behavior that is an integral part of his personality make-up. By understanding this make-up, we can do a better job of placing the right man on the right research job. We can also come closer to understanding what makes him "tick" and therefore are less apt to commit costly managerial blunders in handling temperamental talent simply because of our limited understanding of what these men are like inside. Moore and Renck have recently written an article on morale among scientists that vividly points up some of the conscious "gripes" of technical people in industrial situations. Beneath such collective surface unrests are quite apt to lie individual emotional reactions to supervision, or to types of work experiences that are not "right" for a given individual in terms of his personality needs.

Balancing the Research Team

There are three ways in which we can balance the research team. First, we can balance the individual researcher with those psychological job demands that are most meaningful for him. In other words, we can give him research assignments that will let him express himself as fully as possible. Second, we can help research supervisors gain a deeper under-

standing of the personality characteristics of their various subordinates. In this way, they will be able to help each member of the research team get the most out of himself. And, third, by doing a unit study of the interrelationships among personality factors of the various members of the research team, we can learn how the individuals who compose it affect and influence each other. For example, two able research men may be unknowingly irritating each other and thus impeding their joint effort because of the ways in which their individual personalities clash. The psychological reasons behind this clash may rest on personality factors which neither understands.

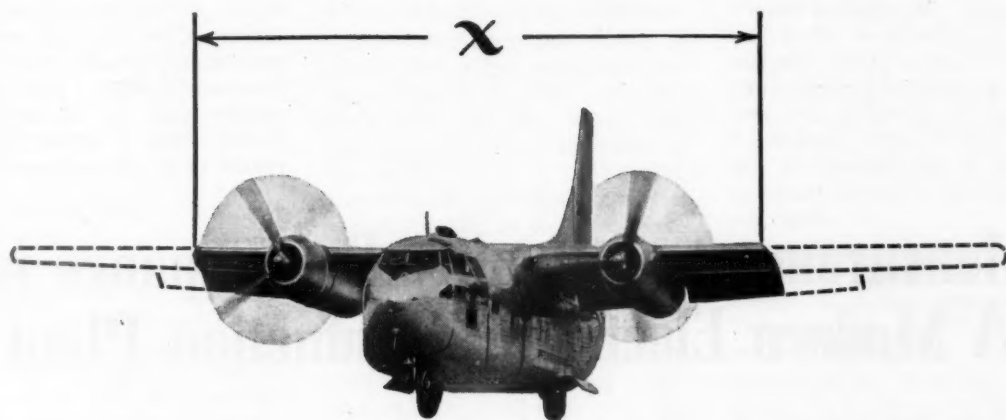
At a time when recruiters are literally "tearing their hair out" in a desperate attempt to find enough scientists with minimum training of any sort to man their company's research installations, it may seem presumptuous to suggest that individual attention be given to each recruit's personality make-up and particular pattern of needs and feelings. Yet, unless we do this very thing, we are apt to hire people, only to lose them in a short time as they go off in quest of another job which they hope will be the "right" one for them.

Particularly in time of shortage do we need to pay more attention to the make-up of each individual researcher. The success of a given industrial research program may well hinge upon the way we recruit and develop our individual researchers—in terms of how we attain organizational objectives and at the same time give each scientist a maximum opportunity for self-expression through creating the type of "psychological job demands" in which they function best.

In an economy where research each year contributes more and more to the company's growth, not to be cognizant of the individual differences among research people might become tantamount to slow corporate suicide. In a world where scientific leadership is fast becoming equivalent to political and economic survival, all of us in every walk of life will directly feel the

(Continued on page 47)

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Measurement of Quality Performance in A Modern Electronic Production Plant

By Mr. Charles Blahna, director of Internal Quality and his assistant Robert Tully, Motorola, Inc.

MEASUREMENT of quality in a plant is rapidly becoming more and more important. From a management point of view, knowledge of process and product quality levels have taken an increased meaning. Technological advances in automatic production coupled with the necessity of reducing overall production costs, while maintaining an ever increasing high level of quality, have brought about the need for development of an adequate quality measuring system.

Techniques for measuring quality performance have, in many plants throughout the nation, lagged the development of techniques for measuring and computing quantity performance. Only since World War II, have great strides been made in this field. Companies supplying equipment to the Armed Services during and after the Korean conflict, have seen the Government Procurement's approach to Quality Control and Sampling Inspection in specifications MIL-Q-5923B and MIL-Std-105A.

In the manufacture of screw machine parts and other products having measurable characteristics and produced in large quantities from one or more machines, the use of X-bar and "R" statistical charts provide an excellent means for measuring process center points, and the amount of variability that is present. These methods would

not apply to a long line of wiring and soldering operators since no variability could be noted. A connection is either properly wired and soldered, or it is not.

In the fabrication of electronic equipment, the need for controlling operator quality prevails, due to the large number of operators required in this type of production.

The method used at Motorola for the measurement of the quality performance of an operator is known as the Quality Index. In addition to evaluating individual quality levels, the Quality Index is used to rate the quality of a process, groups of operators, and entire departments. It is a common denominator for measuring process and finished product quality levels that may have inherent differences. One should not expect to find the same finished product quality level in a very complicated piece of electronic equipment built to Government specifications as is found in an inexpensive radio.

The scale of values which has been chosen extends from seventy at the lower end of the range to one-hundred thirty at the upper end of the range. The center of the scale one-hundred, is considered "bogie," or quality goal. Values above this are considered better than average and values below are classified poorer than average. The scale is divided into four ranges which are categorized as follows:

115	—	130	Excellent
100	—	114	Good
85	—	99	Fair
70	—	84	Poor

In this evaluation there is a linear reduction in Quality Index for a linear increase in reject level. The top of the scale, one-hundred thirty is perfection, meaning either zero rejects per day or zero percentage defective per day. As mentioned previously, a Quality Index of one-hundred denotes the standard quality goal for an eight hour period. This is either figured in rejects or in percentage defective.

Below is a schedule for an operator or a process where the operator's bogie per day or the process reject percentage bogie is denoted by the letter "X".

QUALITY INDEX	REJECTS OR REJECT PERCENTAGE PER DAY
130	0
125	1/6 X
120	1/3 X
115	1/2 X
110	2/3 X
105	5/6 X
100	1 X
95	1-1/6 X
90	1-1/3 X
85	1-1/2 X
80	1-2/3 X
75	1-5/6 X
70	2 X

From the above basic outline, it can be seen that it is not a difficult task to calculate the Quality Index of an operator or process, once the bogie quality level "X" has been chosen. For a group of operators performing the same task, the above table is expanded by multiplying by the number of operators on the line. Example I, shown below, illustrates the computation of a Quality Index Schedule for a hypothetical process.

EXAMPLE I:

Line "E" produces four-hundred radios in an eight hour day. Let us assume that twenty-five operators wire and solder these radios, and each operator does the same amount of wiring and soldering. It is further assumed that the reject bogie "X" is six rejects per operator per day.

QUALITY INDEX

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QUALITY INDEX TOTAL LINE REJECTS FOR EIGHT HOURS

130	0
125	25
120	50
115	75
110	100
105	125
100	150
95	175
90	200
85	225
80	250
75	275
70	300

Sample Calculation:

At a Quality Index of one-hundred twenty, the total allowable rejects equal $\frac{1}{2} \times 6 \times 25$ or 50 rejects. Where $\frac{1}{2}$ is the factor used at Q I of 120, 6 is the allowable number of errors for one operator, and 25 is the total number of operators.

The first step in the installation of this program was to have an informal meeting with the Plant Superintendent. It was the purpose of this session to acquaint the Superintendent and his assistants with the principles and goals of the Quality Index Program. After this important ground work was completed, further meetings were held with the Foremen and Supervisors of those Departments to be connected with the program.

After the indoctrination of Supervising Personnel, the next step was to examine the operations of the line and ascertain that an adequate method of reject reporting was being used. For some years an Operator Quality Card has been used for each operator. This card has eight columns running horizontally, indicating the hour of the day, and six lines running vertically, indicating the day of the week. Each hour, the number of errors committed are posted to the card by the supervisor. In this manner, the operator always knows the number of errors that have been committed. Whenever possible, the errors are shown to the operator, so that he is aware of the reason for a reject being posted to his card.

The next step was to obtain enough data to arrive at a realistic quality bogie. The first department at Motorola to be covered by the Quality Index Program was the Line Wiring Department. All of the operators' cards from each line were collected for a four week period. In a short time cycle used

for building Television Chassis, the line operators are divided into two basic functions: Wiring and Soldering. Approximately three-fourths of the operators do the wiring and the other one-fourth do the soldering.

The wiring operation consists of placing the proper component, resistors, capacitors, coils, connecting leads, etc., into the chassis, and making a mechanical connection to the terminal board or tube socket. The soldering operation consists of applying solder to the wired connection. The types of errors which wirers could make are: Connect the components to the wrong point of the chassis, failure to use the proper component, and failure to put in a component. The types of errors that solderers could make are: Too much solder, too little or no solder, cold solder connection caused by insufficient heat, and a rosin connection where the rosin of the solder prevents a good electrical connection.

Wiring rejects are kept to a minimum by a vigilant check on the material put on the line, and by means of drawings and "Pedros." Each wiring position has either a layout drawing showing the parts to be put in by the operators, or a "Pedro," which is a physical sample showing the parts layouts. These techniques are also used at the soldering stations, but only tend to reduce the rejects caused by unsoldered connections.

Historical records have always shown that the Inspection Department finds more soldering errors than wiring errors. Therefore, it was necessary to determine quality standards for two groups within this department. The Operator Quality Cards were separated for the two groups. The average number of rejects per day for wirers and solderers were calculated from the four week data that had been collected. These figures were reviewed with the Foreman and Plant Superintendents before being officially called standard.

Now that a method had been developed for measuring the individual Quality Index of an operator, the next step was to find a means for measuring the quality of an entire line. One method would be to take an average of the Quality Indexes of all the operators on the

line, which is somewhat time consuming and laborious. The method chosen was to compute a schedule for the entire line. A procedure somewhat similar to the one described in Example I was used. It had to be modified since the assumptions did not apply. All operators were not performing the same task. The following example illustrates how a Quality Index Schedule is derived for a line with operators having different Quality standards.

EXAMPLE II:

Line "F" produces three-hundred Television Chassis. This line consists of twenty-four wirers and eight solderers. Assuming that the quality bogie for wirers is two rejects per day, and the bogie for solderers is six rejects per day, the quality bogie for the line would be $24 \times 2 + 8 \times 6$ or 96 rejects per day. This value of 96 rejects is the allowable number of rejects for a Quality Index of one-hundred. The allowed rejects for other values of Quality Index would be as follows:

QUALITY INDEX	ALLOWED REJECTS PER DAY
130	0
125	16
120	32
115	48
110	64
105	80

QUALITY INDEX	ALLOWED REJECTS PER DAY
100	96
95	112
90	128
85	144
80	160
75	176
70	192

A method had been selected to rate the quality level of an entire line. Once this was finished it was just a short time until all Television Chassis lines were covered by this program. At last, Management had a tool for measuring quality. As time passed, the Line Inspection, Tuner Assembly, and Tuner Inspection Departments had this plan in operation.

The administration of the Quality Index Program is the responsibility of the Outgoing Quality Control Director. All reject information for one day is received in writing or by telephone the following morning. This data comes from four plants in the Chicago area. This reject data is tabulated and a

Quality Index value is assigned. A daily report is issued to each Plant Superintendent, pointing out the lines or operations that have a Quality Index below one-hundred. The Superintendent supplies this daily report to the Foreman in his plant. All Foremen, by the time the report is issued, have taken corrective action to improve the quality of the product leaving their Department, because they have received the reject data from which the Quality Index Report is compiled.

At the end of each week a report is issued covering the quality levels of all operations. This report, in addition to giving the quality report for the past week, presents the Quality Index of all the weeks of the current month and the average Quality Index for the preceding month. The report is issued to the Plant Superintendents and Foremen of all departments covered by the program.

A bar type chart is plotted each week for each process. This chart has a column for each week of the year. Various colored tapes are used when more than one characteristic is plotted. Each chart carries the name or names of the Supervisors responsible for the quality level. These charts are shown at a weekly meeting of the foremen. Quality trend and methods for improving quality levels are discussed. Notes are placed on the charts indicating schedule, model, or personnel changes, and other items which have brought about an advance shift in quality, and these charts play an important part in the Quality Index Program. Although charts of any form do not, in themselves, provide an automatic means for improving quality, they do, when properly used, give information as to causes for poor quality. Once it is known that a quality problem exists, and its cause is uncovered, the solution to the problem is within grasp.

The results gained since the inception of the Quality Index Program, almost two years ago, have been gratifying. In our Line Wiring Department in 1953, the reject level was found to vary from a low point, to a point that was ten times as great. This great rise in reject level was caused by a rapid ac-

celeration of production, necessitating the employment of a great many inexperienced operators. In 1954, the variation was from the same low point to a value that was only five times as great. A greater emphasis on individual operator quality and a better screening of persons being hired have brought about this improvement.

The marking of the Quality Index on the operator's Quality Card has given the Foremen and the Personnel Department a tool for accurately giving the operator a rating for his or her performance. This Quality rating, when coupled with other characteristics such as attendance, job interest and quantity performance, provides a good reference record in the event the operator may be considered for an advancement or a change of jobs. A permanent record of this type aids the Personnel Department in a hiring program when employees who have been temporarily laid off, due to production cut-back, are being considered for recall; i.e., persons with a high quality rating would be recalled before persons with a poor quality rating.

Another benefit gained by the Quality Index Program is the allocation of inspection forces. Lines with very good quality records need fewer inspectors than lines with poor quality records. Overall inspection and repair forces have been reduced in many phases of production. In some phases, inspection has been added in order to prevent errors going into production areas where the cost of repairs would be greater than if they had been corrected at the point of occurrence.

Pinocchio?

The global cargo-troop carrying C-130 Hercules is getting a new nose. The new silhouette has caused some to affectionately start calling America's first prop-jet transport "Pinocchio." With the new Sperry radar system, pilots of the C-130s will have a clear 360 degree picture of terrain ahead and below. Information from the radar "eyes" are simultaneously transmitted to pilot and navigator. This is just one of many advanced modifications going into the C-130.

The main causes for adverse trends in quality are introduction of large quantities of new operators into a line, a model change, an engineering change on a current model, absenteeism, and a schedule change. All of these causes reflect varying degrees of reduced quality levels. By knowing in advance how the quality will be affected by these non-controllable factors, Management is alerted and steps are taken to stabilize the quality levels of the resulting repair costs.

A study is now under way to determine the proper rate of acceleration to maintain uniform quality levels. The results of this investigation should reveal a better means of production planning, whereby Production and Quality Index goals will be achieved more rapidly.

Another desirable feature of this program is that uniform quality standards have been achieved. It is now possible to have quality competition between lines building entirely different products; i.e., at the present time there is competition between lines building television tuners and lines building television chassis. The line that has the highest Quality Index for one month wins possession of the Gold Quality Achievement Plaque for the following month. Competition of this type stimulates all operators to do a better quality job. The operators have attained the feeling of being part of the "team."

This attitude of team spirit and individual pride of workmanship has been lost in many industrial plants of today. Only in the highly skilled trades has this feeling remained. Making the production operators responsible for the quality of their work, and keeping them informed of the importance of doing good work, have done much to improve their pride of workmanship. Quality must be controlled at each individual work station. Quality cannot and should not be inspected or tested into a product; it must be designed and built into the product.

The goal of any quality program is to reduce the amount of rejects, improve quality and reduce repair and scrap costs. Our internal cost reports have shown a reduction in repair and scrap costs. Productivity

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has risen with the reduction of rejects. In the past year, reject levels have reduced sufficiently so that basic changes in quality goals could be made. The quality standard for wiring operators has been reduced over thirty percent, and in one testing operation the standard has been reduced twenty percent.

In the future, when automatic manufacturing techniques play a greater part in the industrial world, the measurement of quality levels will become more important. It is possible for a machine to go out of control and produce many defective assemblies unless a periodic quality measurement is made on the machine. The Quality Index will provide an excellent means of quality evaluation on these machines.

In conclusion, it may be said that in the last two years, since the inauguration of the Quality Index Program, many important changes for the better have taken place. Some of these improvements are listed below, together with the areas of operation that have been affected.

PLANT WORKERS

Operators in all departments have become more Quality conscious as a result of the individual quality evaluation. Pride of workmanship and teamwork among employees have noticeably increased. All of the workers are aware of the relationship of a quality product and high volume of sales. This is extremely important to the employee because of the liberal Profit Sharing Plan at Motorola.

SUPERVISION

All Departmental Foremen and Supervisors now have definite quality levels to maintain. This has necessitated their taking a very active interest in the quality performance of each and every operator in their department. The numerical quality evaluation of individuals has given supervision an added method for determining if an individual is suitable for advancement or transfer. Quality competition between lines of various plants has received the enthusiastic support of all supervisory levels.

MANAGEMENT

The Quality Index Program has

brought reject data from the process level to the desk of Management. It highlights lines and processes which are operating below the established quality goals. The program has pointed out the conditions controllable by Management, such as schedule and model changes, which bring on adverse quality trends in production.

CONSUMER

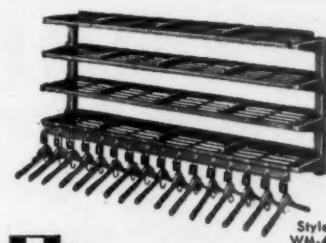
The Quality Index Program has stimulated so much thought and activity concerning quality improvement throughout all phases of operations, that it could not help but bring about a better product for the consumer. Lower reject levels in the production processes will also result in reduced manufacturing costs, which are reflected in lower costs for the consumer.

FUTURE PLANS

The use of Quality Measurements by Management has barely scratched the surface. This method is quite useful in Companies where wage incentives are used. The ultimate effect of this program will be an even greater reduction of rejects in the plant, with a higher quality product being passed on to the consumer at a lower cost.

Ho-Hum—So Easy

Tony LeVier, director of flying operations for the Lockheed Cali-



Checker WALL MOUNTED RACK

Hold More Wraps in Less Space. Standard in checkrooms. Also widely used as self-service racks in coffee shops, restaurants, meeting rooms—wherever people gather. Mount on any available wall space, even over floor obstructions, accommodate 4 or 5 persons per running foot. Provides each with a coat hanger and individual hat space. Keeps wraps aired, dry, "in-press." Come with or without numbers and checks. Strongly built of reinforced heavy gauge steel. Finished in baked enamel. 3'2", 4'2", 5'2" lengths. Mount independently or interlock to make continuous racks of any length.



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fornia Division, told Georgia Management Club members that the world's fastest combat plane—the ultrasonic Lockheed F-104A Starfighter is easier to fly than the T-33.



U.S. Army Photo

Secretary of the Army Wilber M. Brucker greets five civilian industrial executives, members of the Army Advisory Committee for Civilian Personnel Management in his Pentagon office. The committee, comprised of leading civilian officials, meets at intervals during the year to appraise the Army's world-wide civilian management job and to advise the Assistant Secretary of the Army for Manpower and Reserve Forces, Hugh M. Milton II, as consultant on specific problem areas. Left to right: William Kushnick, executive director, Instrument Society of America; Carroll French, director, Industrial Relations Counselors, Inc.; Secretary of the Army Brucker; James O'Connell, vice president, Publix Shirt Corp.; Jefferson Keener, executive vice president, B. F. Goodrich Co.; Robert Blasier, vice president for industrial relations, Westinghouse Electric Corp.

PRODUCTS

designed to deflate production Costs

As a service to OPERATING DEPARTMENTS and PURCHASING OFFICERS, ARMED FORCES MANAGEMENT will provide you with a selected list of manufacturers' products.

How to Use Armed Forces Management's Library—

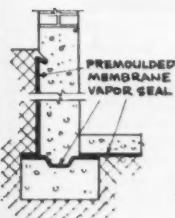
Inserted in this issue, a postage free card is provided for your convenience in requesting descriptive and informative literature. This will be forwarded to you, without obligation. Many cost saving ideas are generated by Operating Departments that have referenced information on products available. Purchasing Officials will find this type of information invaluable. All that need be done is: fill in name and address, circle that which will assist you, and drop in the mail.

DESIGN TECHNIQUES FOR CONTROLLING MOISTURE IN BUILDING STRUCTURES

W. R. Meadows Incorporated. A completely new manual with this interesting title was prepared by a firm of technical engineering



See how the proper installation of a true vapor seal completely isolates the superstructure from the ground...the source of 80% of the moisture induced into a building.

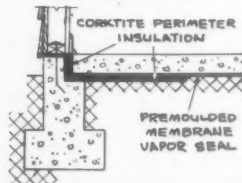


BASEMENT

Premoulded Membrane properly applied to the exterior of the basement walls as well as beneath the floor slab insures a warm, dry, liveable basement. Prevents any movement of vapor or capillary (wick) movement of free water.

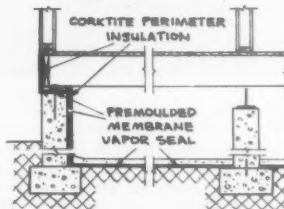


SLAB-ON-GRADE



This illustration shows how the installation of Premoulded Membrane completely isolates the slab from any moisture originating in the site and how Corkite effectively insulates the edge of the slab thereby eliminating heat loss through the slab perimeter.

CRAWL SPACE



The proper installation of Premoulded Membrane and Corkite removes all danger of condensation and oxidation of metal installations in the crawl-space area eliminates the need for ventilation.

writers and planned to sell for \$1.00 per copy. The W. R. Meadows Corporation has agreed to furnish this informative study of such interest to the Armed Forces, without cost or obligation to military architects, engineers and builders. Technical information on vapor condensation is essential in military construction and planning. The photographs depict some of the uses for premoulded membrane. Your copy of this well illustrated manual is available from ARMED FORCES MANAGEMENT library.

For more facts request No. 1 on reply card

MINIATURE RECORDER

Dictaphone Corporation. (See cut). To meet a truly modern business and military communications need, Dictaphone Corporation has introduced the Dictaphone DICTET portable tape recorder. Battery-operated, the sub-miniature instrument weighing less than three pounds, provides a full hour's recording time on re-usable magnetic tape. Capable of being concealed in a pocket or carried in a shoulder-slung leather case, this candid camera size recorder is ideal for field use and recording in cars, airplanes, trains, laboratories and other locations. A single finger-tip lever controls record, re-wind and playback, and by incorporating the latest technological advances in metallurgy and electronics, the DICTET, made largely of magnesium features a completely trans-



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For more facts request No. 2 on reply card

BOOKLET ON F-27 PROPJET TRANSPORT

Fairchild Engine and Airplane Corporation. A six-page, two-color illustrated booklet entitled, "The Case for the DC-3 Replacement," describing the Fairchild F-27 twin-engine propjet transport, has recently been published by Fairchild, and is available without cost by interested individuals.

For more facts request No. 3 on reply card

PAK-A-WAY GOLF DRIVING RANGE

Berlin Chapman Company. The only complete package golf driving range for use in gymnasiums or other rooms of suitable size is the PAK-A-WAY Golf Driving Range, the entire unit of which can be set up for use or folded against a wall in less than two minutes by one person. Specially designed for both right and left-handed players, it includes net, backstop and driv-

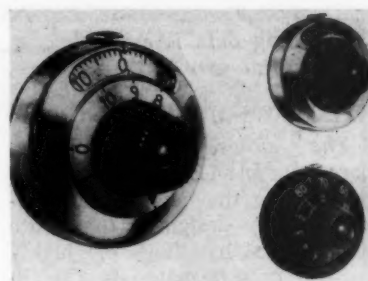
ing platforms with built-in rubber tees and brush mat. Two persons can use the range at one time, and this easy to install equipment will not mar the surface of the floor. Descriptive information and military costs are available without obligation. Ask your Exchange or Special Service Officer to write us for complete details, as we are confident you will enjoy seeing how this equipment can be mounted even on ships at sea.

For more facts request No. 4 on reply card

DIRECT READING DIALS

The George W. Borg Corporation. (See cut). A new line of direct reading concentric-scale dials has just been introduced by Borg Equipment Division, the George W. Borg Corporation, Janesville, Wisconsin.

The new models feature a finger tip brake which prevents accidental change of setting. Dial is only 1 1/2" in diameter. Available in 8 attractive, easy-to-read dial and cover combinations of bright chrome, satin chrome, gloss black and dull black. Black bakelite knobs on all



models. Available with or without finger tip brake.

Direct Reading. The turn-counting dial reads up to 10 turns and clearly distinguishes between the tenth turn and the zero point. The increment dial has 100 equal divisions and is attached directly to the actuating shaft eliminating backlash.

This Borg Microdial indicates position to an indexed accuracy of 1 part in 1000. Operation is continuous in either direction. Precision reading is on the *large* dial which affords maximum separation of graduations.

The dial is delivered completely assembled. Installation is simple



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PLUS Engineering Experience for "SPECIALS" of ALL CONFIGURATIONS

Write Dept. AF-956 for BROCHURE about our PLASTIC PACKAGED Merchandise.

ROCKFORD SCREW PRODUCTS CO.
Rockford, Illinois



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and easy. Literature and complete engineering data is available.

For more facts request No. 5 on reply card

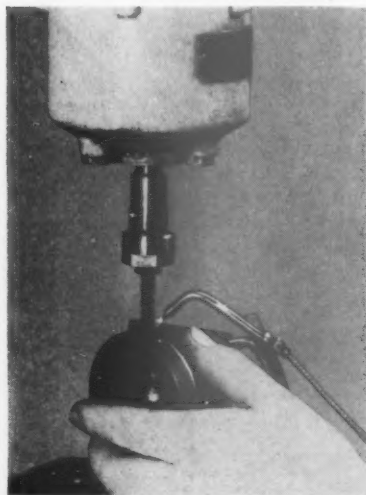
NYLON WEBBING SLING

The Caldwell Company, Incorporated. "LIFTEX" is the name selected for the new Nylon Webbing Sling designed to assure scratch-free handling of highly finished or soft materials. Chemically treated to resist grease, abrasion, alcohols, alkalis, salt water and many solvents. Constructed without rivets or metal, the manufacturers stress the following advantages (1) High strength combined with low weight (2) Fast and complete recovery from shock-loads (3) Low moisture absorption. The Caldwell Company is the maker of the famous adjust-o-leg sling which has been widely accepted in the Armed Forces. Complete literature is available on this new product without obligation.

For more facts request No. 6 on reply card

COOLANT GENERATOR

The Aetna Manufacturing Company. (See cut). The discovery, by the Aetna Mfg. Co., that the



refrigeration principle could be utilized in metalworking is now making many impossible machining operations practical and commonplace, easier and faster. It is reported that cooling with mist has changed the entire concept of cooling and lubricating all types of fabricating operations.

Chips, heated by the separation from the work, transfer heat to the tool which then loses its temper

and sharpness and provides a poor finish. Flood cooling lacks efficiency because the coolant is mainly applied to the chips and not the cutting edge of the tool.

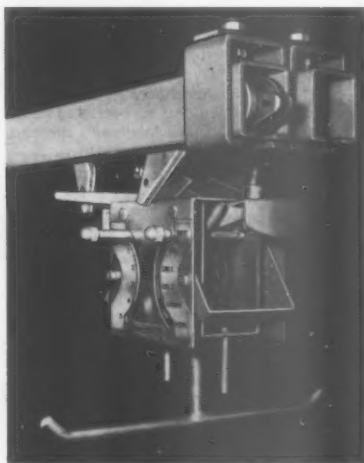
Refrigerated mist, properly applied by the Aetna Mist Mist Coolant Generator, cools the actual cutting edge of the tool. Refrigerated mist cooling will increase production efficiency, cut tool costs and enable you to produce finer finishes.

For more facts request No. 7 on reply card

OVERHEAD AUTOMATIC DISPATCH SYSTEMS

The Richard-Wilcox Manufacturing Company. (See cut). The Richard-Wilcox Mfg. Co., announces production of their new R-W "TWIN-TRAK" Overhead Automatic Dispatch Systems. This new conveying system, the result of many years research and development, is reported to provide automatic-selective control over the movement of parts to predetermined areas through the production and storage facilities of an entire plant. Component parts may now be automatically supplied to each work station as they are needed from individual storage banks or lines.

The power and free R-W "TWIN-TRAK" Automatic Dispatch Systems have been engineered to use proven R-W component parts that are readily available for expansion or economical maintenance replacements. A "TWIN-TRAK" system may be combined with present R-W "Zig-Zag" conveyor systems and will integrate many individual con-



veyors into one factory-wide, automatic conveying system.

An R-W "TWIN-TRAK" Automatic Dispatch System is a compact, flexible unit that may be quickly, easily and economically installed . . . requires only a minimum of space . . . track curves may be formed on a radius as small as 2'.

The R-W "TWIN-TRAK" Automatic Dispatch System is available with either manual or electronic selector controls depending on what type best suits your individual requirements.

For more facts request No. 8 on reply card

ALLIS-CHALMERS EQUIPMENT BROCHURE

Allis-Chalmers Manufacturing Company. A new and informative booklet, 16 pages of technical and instructive material named "FACTS," has recently been published by this time-honored organization. Designed to assist in (1) Choosing your equipment (2) Maintaining its efficiency (3) Handling your job, this important reference manual will be forwarded to you without cost or obligation.

For more facts request No. 9 on reply card

PHOTORAPID MACHINE

Photorapid of America, Incorporated. Janos Szekeres, president of Photorapid of America, Inc., of New York City, announces that their Photorapid machines now combine the diazo system with conventional photo-copying. This means, according to Mr. Szekeres, that, in addition to the normal single photo copies, one may now make unlimited prints from one negative with the Photorapid. The user first makes a Photorapid transparency from material printed either one or both sides, opaque originals, or "anything the eye can see," utilizing the diazo system in his standard Photorapid machine. From this one transparency he can produce as many sharp, black copies as desired on the Photorapid machine.

"This new system is the culmination of many months of experiment and research at our factory," said Mr. Szekeres, "and I consider that the combining of all photocopying operations is a remarkable step forward. We believe that it

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will literally revolutionize office copying. In addition to the simplicity and ease of operation, anyone can operate a Photorapid machine with just a few minutes instruction—the prints will cost less than 2c each! So far as we know, this is less than the cost of any other comparable copying system."

For more facts request No. 10 on reply card

TEST LABORATORY FACILITIES

Electrical Testing Laboratories, Incorporated. To enable executives, engineers and others in industry and government to evaluate its capabilities, a new 72-page bulletin covering its services and facilities has just been published by the Electrical Testing Laboratories, Inc., leading independent testing laboratory. The informative bulletin covers Chemical, Electrical, Electronic, Mechanical and Physical, and Photometric, Radiometric and Colorimetric Testing. Also describes Spectroscopy, Photomicrography, Environmental, Near Infrared and Ultraviolet Facilities. Copies available to interested organizations without obligation.

For more facts request No. 11 on reply card

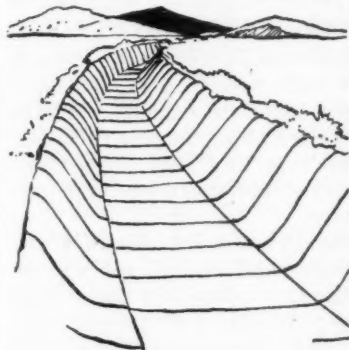
AUTOMATIC PROJECTOR

Tel-A-Story, Incorporated. (See cut). An automatic, portable projector for use in recruiting, training, and aircraft identification is available, according to the manufacturer, TEL-A-STORY, INC., of Davenport, Iowa. The machine has a built-in 156 sq. in. picture screen using twelve 35mm or square 2 x 2" full color transparencies, automatically changing copy every six seconds.

Training command personnel will find TEL-A-STORY ideal for holding the attention of trainees.



... insure the **COMPLETE** containment of water, wastes, sludges and sewerage in ...



- IRRIGATION PROJECTS
- INDUSTRIAL RESERVOIRS & WASTE CONTROL PONDS
- MUNICIPAL WATER AND SEWERAGE PROJECTS
- MILITARY INSTALLATIONS

"Hydromat" hydraulic mats, developed and manufactured by the leading manufacturer of asphaltic products for over 30 years, were developed in a scientific manner to provide a lining material that would allow the COMPLETE containment of water, wastes, sludges, sewerage, etc. "Hydromat" is installed as a monolithic liner, with mechanically sealed joints, that will expand and contract with soil movements without rupturing or

breaking the seal. "Hydromat", a fully exposed type of lining, may be installed quickly and easily by untrained labor ... make-ready requires only a minimum of time and effort. "Hydromat" provides the practical answer to the problem of efficiently relining old, cracked concrete or gunite linings. "Hydromat" hydraulic mats are produced in sheet sizes 4' wide up to 12' long ... available in thicknesses of 5/32", 1/4" and 1/2".



WRITE TODAY!

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For more facts request No. 29 on reply card

The automatic changing mechanism makes the projector simple to operate. The visual retention of the image on the screen is high, according to the manufacturer, and makes the projector an important training aid. In addition, full color transparencies can be used for recruiting purposes, and Tel-A-Story is now in use by some branches of the service.

The projector has a luggage type finish and weighs 25 pounds. Motor operates on 115 volts AC, completing cycle of 12 transparencies in 96 seconds. Uses 750 Watt long life lamp with Special Polarized Screen and comes equipped with 10' rubber covered power cord. Fully approved by Underwriters Laboratories. Extra slide carriers equipped to handle additional transparencies are available.

For more facts request No. 12 on reply card

MULTIPLE CHANNEL MAGNETIC RECORDING HEADS

Data Storage Devices, a Division of the J. B. Rea Company. (See cut). A new and improved line of multiple channel magnetic recording and playback heads for a wide variety of uses, such as computer input-output equipment, memory drums, discs and telemetering recording. The audio field is covered with heads for ¼ inch tape, 16 mm and 35 mm film. The unique design and construction methods used in these heads has resulted in the practical elimination of all of the major disadvantages previously existing in magnetic heads. Depicted are a few of the heads available: a binaural head for ¼ inch tape, a 4-channel Cinemascope motion picture head, a 7-channel head for ¾ inch tape and a 14-channel, interlace head for one inch tape. A complete brochure on these and



other products is available without cost.

For more facts request No. 13 on reply card

DIRECT READING ELECTRONIC MICROMETERS

J. W. Dice Company. Bulletin 4003, which has just been published, graphically shows four reference standard Electronic Micrometers for making direct measurements to 20 millionths of an inch. Applicable to hard or soft materials, conducting or non-conducting, pressureless measurement unaffected by temperature, vibration, leveling or aging of tube. ARMED FORCES MANAGEMENT library will be pleased to send you Bulletin 4003 upon request.

For more facts request No. 14 on reply card

GYROL FLUID DRIVES

American Blower Corporation. A new eight page 8½ x 11 well illustrated two-color catalog (Bulletin 9819) describing the new 1 through 25 hp Type VS Class 2 Gyrol Fluid Drives is now available from our library.

The new catalog discusses advantages and typical applications of the new adjustable speed fluid drives. Design and general construction features are described and illustrated by means of a cutaway view. Close-up photographs of optional speed control mechanisms are also included to illustrate these features. A complete description of the operation of the new units is also given in the new catalog.

Selection tables are provided for the full line in the 1 through 25 hp range for both direct connection and belt drive arrangements. Installation drawings are also included which give basic dimensions of the four new fluid drive sizes for the basic unit and for another arrangement with flange-mounted drive motor.

For more facts request No. 15 on reply card

BELCO REPLACEMENT FAUCET STEMS

Miller Manufacturing Company. Leaking compression type faucets, lost water and excessive maintenance costs are gone forever with the installation of Belco ball bearing replacement stems, complete with bibb washers. The bibb

washer is only under compression and is not subject to cutting or grinding action.

For more facts request No. 16 on reply card

MUTUAL INVESTMENT FUND FACTS

Brown, Madeira, and Company. This company, specializing in mutual investment funds, will send, without obligation, facts about conservative, middle-of-the-road, and aggressive types of investments and mutual funds.

For more facts request No. 17 on reply card

VISUAL CONTROL BOARD

Wassell Organization, Inc. Production not only schedules but automatically checks with time, line, and color control, has low original and upkeep cost.

For more facts request No. 18 on reply card

COMMON STOCK INVESTMENT

Hamilton Management Corp. Through Hamilton Funds, Inc., a managed common stock investment fund, this firm offers lump sum or monthly investment plans to fit any budget. Interested persons can inquire without obligation. Firm recently declared another quarterly dividend.

For more facts request No. 19 on reply card

VISUAL MANAGEMENT CONTROL

Graphic Systems. This New York firm invites men interested in efficient management to get things done with Boardmaster Visual control which gives a graphic picture of operations, spotlighted in color, saves time, money, and stops errors.

For more facts request No. 24 on reply card

MODERN FLOW BENCHES

Equipto Division of Aurora Equipment Co. Send For 16-page catalog No. 200 illustrating and describing this outstanding line of top-quality benches.

For more facts request No. 21 on reply card

CHECKER WALL MOUNTED RACK

Vogel-Peterson Company. Hold more wraps in less space. Write for Bulletin CK455.

For more facts request No. 22 on reply card

ARMED FORCES MANAGEMENT



Book Reviews

by D. D. Corrigan

What is a Book?

"1956 BRITANNICA BOOK OF THE YEAR," published by Encyclopaedia Britannica, Inc.

A book is a pathway to pleasure, a guidepost to understanding, a visit with old friends and new, a trip to another land, a tour of familiar sights, and a bird's-eye-view of the world's happenings. A book is a companion that is always handy, can be set aside temporarily, and acquaintanceship resumed at a moments notice. A book is a friend of which one never tires, demands nothing, and only brings enjoyment to fill many empty hours.

A book is a record of man's achievements on earth, the only permanent recording that permits men to know his history and accumulated knowledge of both the past and the present. Britannica Book of the Year is all of these many splendored things.

This Book of the Year has one of the largest circulations of any work in the English language. It is literally a book of the previous year, and chronicles the year's activities. This work has a dual purpose; that of keeping the owner of the set of Britannica Encyclopaedia up-to-date with current progress in all fields, and to present a record of each year.

Six hundred contributors, four hundred striking illustrations, one thousand articles, gives a wide coverage of world events from the viewpoint of outstanding experts in all fields. Many of the same contributors to the Encyclopaedia write for the Book of the Year. Able Editor Walter Yust directs the editorial staff.

The book can be divided into three separate parts. The first section is three feature length articles of special interest and of timely importance, the second is the Calendar of Events, and then the encyclopaedia section.

Beginning with, "Canada: The Land and the People," the reader will find an illuminating and informative article telling the full story of the near neighbor of the

United States. Misconceptions have arisen about Canada, but there are many reasons that make this country a puzzling land. Sir Wilfrid Laurier has remarked, "the twentieth century shall be the century of Canada." The chapter on the land, the seaboard, the plains, the hinterland, tell of the geographical peculiarities. The descriptions of the peoples of Canada shows the newer "Canadians" rather than as French, British, and other nationalities. An outstanding portrayal.

The name of Commander Robert C. Truax, U.S.N. will be familiar to readers of ARMED FORCES MANAGEMENT. He has written the second feature story, "Dawn of the Space Age." He tells of rockets, orbital technique, a voyage around the moon, and the atomic rocket. Fascinating is this look into the new dimension of space travel.

William Benton reports on, "The Voice of the Kremlin," from his first-hand observations of propaganda techniques of the U.S.S.R. and the Satellites. His visit took place in the autumn of 1955, and his article has triggered much discussion and further investigation. The education system, Soviet aims, the Soviet press, writers, fields of entertainment, are scrutinized with reference to propaganda techniques.

The Calendar of Events, 1955, gives a day-to-day observation of all important events as they happened. Starting with January 1, when the U. S. Foreign Operations Administration began aid to certain states in Indochina, dates are accounted for through December 31, 1955, when Britain placed a ban on exporting surplus war material.

The third section, the largest in the book, is an annual encyclopaedia. Here the reader will find more than 100 biographies, hundreds of obituaries, accurate definitions of new words and meanings, and important data in all fields of knowledge. The year's activities are enumerated under such varied headings as International Court of Justice, Hormones, Hoover Commission, U.S. Department of De-

fense, Awards and Prizes of 1955, and Industrial Health. An alphabetical look shows cheese, chemistry, chemotherapy, chemurgy, cherries, chess, Chiang Kai-shek.

All owners of the Britannica Encyclopaedia can be gratified that this book supplements the information of the set itself, and protects the owner's investment. For reference, scanning or thorough reading. Britannica Book of the Year is a distinguished edition, and has been referred to by a certain well known person as, "Terrific, what a book!"

A Conference With Twenty Experts

"BUSINESS MANAGEMENT HANDBOOK," Edited by J. K. Lasser (McGraw-Hill), 809 pages, \$8.50).

A letter came to my desk the other day that read, "Can you recommend one good book on management that will give a complete picture of business knowledge? I know of many specialized books, but I need a book that presents the larger concept, an overall well-rounded source of information on all phases of management procedure." I answered him that there is such a book, "Business Management Handbook," edited by J. K. Lasser. Originally this was a 24 volume executive reading course selling at \$38.50. Today the course has been streamlined and brought up to date in one volume, for quick reading and reference.

If a person could travel around the country and have a personal conference with the twenty experts who wrote this book, the time and expense would be necessarily high. The same purpose is achieved in this book, for each of the twenty chapters is similar to an interview with each authority, but contains more information than could possibly be covered in a question and answer chat.

Mr. Lasser starts with the beginnings of a company and describes finding the right form for a business. This chapter evaluates corporations, partnerships, trusts, cooperatives, and other forms with regard to taxes and competition. Financing a business receives the attention of William Casey, and relates to capital, long and short term financing, expansion, and ways and means.

How to Organize Your Business for More Efficient Management presents the latest techniques for business, and is followed by a discussion of avoiding business risks and covers what the risks are and what can be done about them.

Down-to-earth facts are given on starting a business, buying and selling an established business, and how to market the product.

Human relations are analyzed in three phases with regard to customers, employees, and stockholders. Standards are set forth as to securing the best possible customer relations, the newest ways of organizing and using good employee relations, and outlining how to keep stockholders interested and yet informed of the progress of the company.

Accurate details tell the successful procedure to follow in finding a business location with emphasis on metropolitan districts, prices, owning and leasing. The chapter on running an accounting system gives the answer as to how to get the best results with the least effort, from the viewpoint of the executive and the accountant. Distribution costs is one of the phases receiving much attention today, and Charles Sevin covers customers, channels, orders, territories, salesman, and products. C. W. Sargent shows how to build a cost system to serve specific needs and purposes of management. Objectives, controls, plans, and operating the system gives a well-balanced and complete design for requirements of the cost system.

The most modern methods of avoiding fraud and employee dishonesty are examined by John B. Thurston. Why, who, when, where, and how frauds are committed provides a complete check list. The objectives of using a budget for control of a business defines the preliminary groundwork, beginning installation, and establishing a permanent budget installation.

John Neuner covers the complicated field of designing a system for business internal control with reference to inventories, expenses, payrolls, cash, and special assets. The important aspects of forms, paper work, records, files, receives the attention of George Vandewende in establishing and admin-

istrating a program of control of business paper work. Business insurance outlines risks, coverage needed, savings and effects. Doing business abroad considers channels, representation, agencies, exports, foreign investments and tax and license considerations.

The view of each authority as presented in this collection or guidebook, shows successful methods in all phases of management. "Business Management Handbook" will be used for reference, specialized interests, and yet is easy to read, simple to understand, and interesting enough to just sit and read from cover to cover.

Military Law

"MILITARY JUSTICE IN THE ARMED FORCES OF THE UNITED STATES," by Robinson O. Everett, 338 pages, \$5.00).

In order to write an accurate and useful book on military justice, it is of primary importance that the author be well versed in this field in an academic way and in an experienced manner. Before describing the book, then, let us find out who Mr. Everett is, and how does he qualify as an authority on military law.

As a former Commissioner, U.S. Court of Military Appeals, Robinson O. Everett has had actual experience. As legal officer in the Armed Forces, as Commissioner, and as a civilian attorney who is now engaged in handling justice matters for military clients, his views are accurate and his understanding is based on facts. Judge W. Brosman, U.S. Court of Military Appeals writes in the forward, "I am confident that Mr. Everett's opus represents an important contribution to the criminal law of the military establishment — and a unique one." He further states that this book will be of use to the military lawyer, the general military reader, civilian lawyers, the law student, and the nonlegal general reader.

Mr. Everett explains the background need of military justice and interprets the Uniform Code of Military Justice. Evaluations are made of developments which have resulted from precedents based on opinions handed down by the

U. S. Court of Military Appeals. Procedures are given of Court-Martials, charges, and punishment.

This is a timely book, well organized, complete, and will be used by many as an indispensable handbook.

An Exciting Preview

"AIRCRAFT TODAY," edited by John W. R. Taylor (Philosophical Library, 96 pages, \$4.75).

The cover picture of "Aircraft Today," is an exciting picture and serves as bait to lure the reader to explore the reading matter. Anyone who does read this book will not be disappointed, for it is for all types of people to keep them informed of the latest developments in today's aircraft. This is an annual publication, a collection of articles, written by men who design aircraft, test planes, men who are experts in this field.

The illustrations are top notch. One of the unique diagrams shows the cockpit of the Soviet MIG-15 Jet-Fighter, with an explanation of each part. A French amateur builder is shown assembling a home-made do-it-yourself light-plane. Eric Burgess, F.R.A.S., tells the story of push button warfare. The future of military air transport is examined by Air Marshall Sir Robert Saundby. The present and future are well analyzed along with memoirs of the past. Something has been included for everyone, and the mixture should prove interesting to the reader of "Aircraft Today."

Recommended Books

"THE PSYCHOLOGY OF INDUSTRIAL CONFLICT," by Ross Stagner (John Wiley & Sons, 550 pages, \$8.00).

A book that investigates deeply into the psychological factors relating to industrial conflict. For those interested in management, human relations in business, and of great value to leaders in all positions.

"INSIDE INDUSTRY," by Ray Smith. (Creative Enterprises, 139 pages, \$3.50).

Case histories and examples highlight the opinions as set forth by Mr. Smith on problems in man-

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agement. Mr. Smith believes that "Attitude is the most vital force in industry today."

"STANDARD & POOR'S SELECTING STOCKS TO BUY FOR PROFIT," by Carl Roth and John T. McKenzie (Henry Holt, 263 pages, \$4.95). •

Basic recommendations and bits of advice concerning the stock market, for those who already have a good understanding of what transpires on Wall Street. Much of the information comes from Standard and Poor's Guide.

"ELECTRONIC DATA PROCESSING FOR BUSINESS AND INDUSTRY," by Richard G. Canning (John Wiley, 332 pages, \$7.00).

Mr. Canning has gained his experiences as an electronic engineer with the International Business Machines Corp., and with the U. S. Naval Air Missile Test Center. He presents electronic data processing as regular capital equipment which can be evaluated practically and realistically for an effective course of action.

"HOW OUR ARMY GREW WINGS," by Charles Chandler and Frank Lahm (The Ronald Press Company, \$3.75).

A book in the classic tradition describing the history of the Army Air Corps, with special attention to people, machines, performance, altitudes, speeds. Completely absorbing and accurate.

"THE LAST SQUADRON," by Gerd Gaiser (Pantheon, 251 pages, \$3.50).

A novel telling about the air war as seen from the German side.

"THE HOOVER REPORT," by Neil MacNeil and Harold W. Metz (Macmillan, \$6.00).

A clear condensation of the Hoover Commission's report to Congress.

• Re-enlistment rate of U. S. soldiers in Europe was up sharply in 1955 over 1954. During the first ten months of the year, nearly 14,000 signed up for another hitch compared to slightly more than 4,500 in the same period of the preceding year.

Army Announces Tentative Schedule Of Field Training Exercises For FY 1957

The forecast of major field and command post exercises to be conducted between July 1, 1956 and June 30, 1957, was announced recently by the Department of the Army.

The tentative schedule lists seven field exercises which will involve approximately 84,000 troops and include divisional, mountain, jungle and Arctic orientation type exercises.

Exercise RED ARROW is scheduled to take place during November and December, 1956, at Fort Leonard Wood, Missouri. Participating in the combined and unit training exercise will be the 1st Infantry Division from Fort Riley, Kansas and other supporting units.

In January-February, 1957, one regimental combat team of the 82nd Airborne Division from Fort Bragg, North Carolina, will be airlifted to Alaska to participate in Exercise NORTHERN LIGHT, a training exercise in Arctic operations.

The 1st Armored Division from Fort Hood, Texas, will take part in Exercise SLEDGE HAMMER at Fort Polk, Louisiana in February and March, 1957. This exercise will feature troop tests of SKY CAV II, engineer assault equipment, and aerial resupply of armor in the exploitation phase.

Training exercise RIO SELVA will be conducted by a battalion combat team of the 82nd Airborne Division in the Panama Canal Zone in March and April, 1957. This exercise will provide field training in jungle operations and the reinforcement of the Caribbean Command from the continental United States.

Exercise KING COLE, a command post exercise in the field, is scheduled for April, 1957, at Fort Polk, Louisiana. Involving approximately 26,000 troops, KING COLE is designed to train staffs and participating units in new tactical concepts, organization and techniques adopted by the Army. Participants in this exercise include Headquarters III Corps, Headquarters XVIII Airborne Corps, Headquarters 1st Armored Division, Headquarters of the 1st and 3rd Infantry Divisions,

Headquarters of the 82d and 101st Airborne Divisions, the 2d Armored Cavalry Regiment, the 2d Logistical Command, and field artillery units including 280mm, Honest John, 8" howitzer, and Corporal. KING COLE will emphasize a free maneuver over great distances.

Exercise INDIAN RIVER will be conducted by the 4th Infantry Division in May, 1957, at Yakima, Washington, to provide combined and unit training. The 4th Division, now in Europe, will be stationed at Fort Lewis, Washington, by the time the exercise is held.

A training exercise in mountain and cold weather operations, COLD SPOT, will be held at Camp Hale, Colorado, beginning in July, 1956, and continuing through next spring. Involving approximately 3,500 troops over the extended period, it will provide training in mountain operations at high altitudes. Participating will be two battalion combat teams of the 1st Infantry Division and elements of the 77th Special Forces Group.

In addition to the scheduled field exercises, tactical command post exercises will be conducted by the Army headquarters in the continental United States. These exercises are intended to provide training for commanders and staffs in tactical, intelligence, and logistical operations under assumed conditions of extensive atomic, chemical, biological, radiological, and electronic warfare capabilities of both friendly and enemy forces. A logistical command post exercise, LOGEX 57, is scheduled for Fort Lee, Virginia, in May, 1957. Participants in LOGEX 57 will be student officers at technical and administrative schools and selected Army Reserve officers.

Available Now!

Armed Forces Management

is again this year offering at cost handsome bound volumes of the previous year's issues. Finished with a red leatherette cover, Volume II, October, 1955, to September, 1956, issues, is available for \$10 by writing Armed Forces Management, 208 S. Second St., Rockford, Ill. Orders for last year's Volume I exceeded supply, so we suggest you mail your order now.



by **Rear Admiral F. L. Hetter**
Commanding Officer ASO/NASD

Naval Management Analysis Solves Field Communications Problem

NOWHERE do overall problems that develop in a large naval shore establishment appear more strikingly than in the Communications Office. The mission of this group is to serve the entire installation with a means of rapid transmission of information to and from other far-flung activities with related functions. Thus, Communications becomes the focal point for many matters affecting the personnel served. By fixing its attention on the Communications Office, command can readily develop an insight into the entire activity based on cross-sections observed in one small area.

For the past several years a multi-faceted management problem had developed in the Aviation Supply Office and the Naval Aviation Supply Depot, Philadelphia, Pa. The problem was readily diagnosed and corrected through the agencies of the Communications Office. What had originally appeared to be a communications problem alone, was actually an overall management problem. The

development of the problem and its implications can be traced in a discussion of naval teletype messages originated in ASO/NASD.

Since Korean Hostilities, use of naval teletype messages has greatly expanded. Whereas use of a dispatch was a minor event years ago, the increased need for rapid communications observed during war years resulted in revamped habits. Since Korea, messages transmitted by ASO/NASD and other activities have considerably increased in volume. Use of dispatches to transmit comparatively minor information of dubious immediacy became increasingly evident. World-wide communications facilities were therefore taxed and their efficiency hampered. Naval messages have become the ordinary rather than rapid means of communication. Buried in this deluge of unnecessary traffic have been the essential messages whose flow has been impeded.

This problem has been particularly acute in ASO/NASD. The volume of incoming and outgoing

message traffic increased 50% within the past two years, climaxing in August, 1955, when the level exceeded the Korean War peak by 10%. Communications personnel were literally deluged with messages and backlogs considerably increased. Management practically reorganized its personnel to cope with the situation but to no avail.

Incident to increased administrative message traffic and the subsequent watering-down of the importance of individual messages, a further complication developed. Increased message volume caused less concentrated attention throughout ASO/NASD on the construction of the message. There was a disintegration in quality, clarity, and detail of messages. Construction of messages became loose and shoddy. Communications was burdened with not only transmittal of messages but editing prior to transmission. Instead of primary devotion to expediting message flow, communications personnel effort was being diverted to this additional complication. Communications Officers inaugurated lecture campaigns on proper use of the naval message system to indoctrinate message originators. These lectures accomplished only a small and temporary improvement despite the scope of the campaign. The moment campaign emphasis diminished personnel redeveloped old habits and re-abused the message form. Operating components pressed by their own problems disregarded the communications problems.

A third problem which almost resulted in a complete breakdown of the communications system was the habit formed by top supervisors responsible for releasing messages. Daily messages were allowed to accumulate throughout the day while they attended to other supervisory responsibilities. Toward the close of the workday they would sign all accumulated messages and forward them to the Communications Office. All efforts to combat this inertia were unsuccessful. Communications receipt of such messages at the end of the day shift, placed the entire burden of transmission on evening and mid-watches. This, along with other factors, resulted in large backlogs

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On the surface it looked like communications was faced with its own insurmountable problem. The foregoing analysis was based on general observations as follows:

- (a) Heavy message volume was causing communications to run 12-30 hours behind normal transmission schedules.
- (b) Field activities were placing responsibility for delayed messages directly upon the Communications Office.

A critical analysis of the situation was in order, and when made revealed the following:

- (1) Though not purely a communications problem, the difficulties could be corrected by the Communications Office through effective coordinative action.
- (2) Abuse of rapidity of communications requirements by personnel implied possible abuse of other specific functions for specific purposes.
- (3) Loose and ineffective message preparation and format by personnel implied possible transmittal of such inaccuracies to other areas.
- (4) Delayed release of important messages by personnel implied possible delay in other important functional areas.
- (5) There evidently existed a management problem of some magnitude involving 4,000 individuals spread over 26 buildings on a compound almost 1 mile square.
- (6) Since the problem was easily detected in the Communications Office it was logical to initiate corrective action at that focal point on the theory that a flow may best be controlled in the region of smallest section.
- (7) What was not within the authority of correction by Communications could be controlled by broadening the scope of Communications authority.

Command gave necessary authority for correction of the problem areas to the Communications Office. It was first authorized to establish time limits in order to reduce delays in message traffic from areas far removed from Communications. A two hour limit was

established based on the time a message was actually written and time of arrival in the Communications Office. This served to emphasize—

1. The purpose of a naval message—speed.
2. The subsequent necessity for speed in handling of the naval message.
3. The necessity for an even flow and distribution of work throughout the organization both for naval messages and (implied) all other work.

Simultaneously with the new emphasis on the importance of speed in handling naval messages, an extensive series of lectures was initiated throughout the compound designed to reach each individual employee who composed or released messages. The lectures strongly emphasized need for communications improvement. The purpose and use of the message form was developed and a folio of material (abbreviation lists, instructive outlines, etc.) was distributed. The effectiveness of this lecture series compared to the previous ones was immediately apparent. Lecturers presented a planned overall program and did not speak in general and abstract terms.

Most important of all was the discretionary authority given to Communications Office to accept or reject messages based on delays, quality, format, and necessity for transmission. To assist in this program, supervisors of areas of greatest message output were directed to participate, for one day, on a rotating basis, in the operations of the Communications Office. They were able to assist Communications personnel in making decisions regarding rejection based on first-hand knowledge of operational procedures, to gain insight into "Communications" problems, and to take corrective action by means of liaison with their own organizational component.

The refined procedures have been in operation for 4 months. It should be noted that compared to average total transmission time of 22 hours in August, the December overall average was 9½ hours.

Less calculable by graph but equally significant is the improved

quality, clarity, and legibility of messages received for transmission. These factors greatly contribute to the ability for more rapid processing of messages. Ironical is the fact that rejection of messages has been rare. This is the best barometer of inter-department cooperation with Communications. It need not be emphasized that the ramifications of improved rapid processing of messages have been manifested in improvements in other work procedures and areas.

The results discussed herein are not final, however significant they may seem. The lectures and present improvements have served to ferret out other areas in which local operating level habits must be coordinated with overall management requirements. Further, past failure has proven the need for periodic refreshment and indoctrination of personnel. These are present and future programs which will keep the thousands of users of communications facilities ever aware of the importance and limitations of the services rendered to them, and the need of their own efforts in the assembly-line of information processed through such facilities.

Thus, problems affecting the operations of a large establishment may be analyzed through observation of one small segment of that organization. Experience developed through critical examination of this activity's communications problems has enabled wide-spread improvement in the overall operations. Consciousness of critical areas within an organization, such as Communications, which serve as the pulse for the efforts of the activity as a whole is essential to effective management.

Saratoga 2d Navy Vessel Outfitted With TACAN

When the Navy's most powerful aircraft carrier—the sleek, 60,000-ton Saratoga—was commissioned, it became the second U.S. flat-top to be equipped with a TACAN (tactical air navigation) system and with a long-range, ultra-high frequency radio system.

These two radio aids were developed by Federal Telecommunications Laboratories here, a division of International Telephone and Telegraph Corps.

Conservation through Suggestions

"ARE YOU SENDING YOUR WINNERS AND THEIR SUGGESTIONS TO ARMED FORCES MANAGEMENT?" Other installations are interested in your program. Send them to—"The Editor", ARMED FORCES MANAGEMENT, 208 South Second Street, Rockford, Illinois.

Andersen Air Force Base, APO 334, San Francisco. Colonel Frank E. Marek, Base Commander, announced recently that \$26,329 was saved on electrical consumption at this Strategic Air Command post during fiscal year 1956. The savings figure was made in comparison with totals from the same period during 1955. The utilities conservation program established by Colonel Marek about a year and a half ago paid dividends in spite of the increase in construction and new installations. The Base has an Airman First Class Thomas L. Hughes, who is \$25 richer today resulting from a suggestion made while he was stationed at Malmstrom Air Force Base in Montana. The idea was placing loose gravel around the base of fire hydrants where excess water could drain off quickly to keep them from freezing and possible damage.

Headquarters United States Army Caribbean, Corozal, Canal Zone. Captain Raymond Wagner, Quartermaster Quarters Property Officer at Fort Clayton, received the Army Commendation Ribbon with metal pendant for his efforts in suggesting and instituting a card for recording quarters furniture which takes the place of numerous issue and turn-in slips and their consolidation. It is estimated the use will save the Panama Area approximately \$17,000 annually. Miss Grace Miller after a Work Simplification Study, recommended improvements which resulted in

savings and benefits amounting to \$7,281. Miss Miller was awarded \$80 for introducing a new layout of office space and elimination of equipment in the Clothing and Equipage Unit.

Naval Air Station, Corpus Christi, Texas. Mr. L. F. Williams, an employee at O & R department, was recently presented with a check for \$175, the largest award ever presented at the station. Designing and building a machine that will perform the wrap and stretch operation necessary to manufacture certain aircraft parts which are formed to contour, was his idea. A remarkable part of the machine is its ability to bend stock and stainless steel to contour without loss of metal strength.

Craig Air Force Base, Alabama. A Craig airman has come up with an idea for improved maintenance on T-33 jet aircraft that will save the base an estimated \$2,835 annually and has a potential savings for the Air Force of several hundred thousand dollars. He is A/2C Peter J. Selinsky, Jr., jet mechanic with the 3616th Flight Line Maintenance Squadron, who devised a simple modification of the battery cover for the T-33 which enables a maintenance man to check and service eight batteries in planes in the same length of time it formerly took to service two. \$25 in cash and a three-day pass rewarded the airman for his suggestion and in addition he became the first man on the base to win an improvement cash award.

Fort Benning, Georgia. Approximately \$229,000 and 161,000 miles of traffic will be saved annually at Fort Benning by the use of ideas developed in the Infantry Center's work simplification program this fiscal year. The savings represent

\$43 for each hour supervisors spent in work simplification classes. An additional \$1,045 was presented to 11 civilians and three servicemen for suggestions during the month.

Norfolk Naval Shipyard, Portsmouth, Virginia. Thirteen employees were presented cash awards in recent ceremonies at the installation for dollar-saving ideas. Mr. Horace V. Robinson, supervisory mechanical engineer, Design Division, was the top winner with a check for \$300, representing his suggestion to redesign catapult deadloads for use aboard carriers.

Headquarters Fifth Army, Chicago, Illinois. Adopted employee suggestions during the first three months of 1956 will save an estimated \$148,999 in the Fifth Army area during their first year. This figure released by the Department of the Army, represents the highest savings for the six continental United States Army areas and the District of Columbia. 114 of 463 civilian sponsored suggestions earned their originators a total of \$4,115 after acceptance. There were 22 of 181 soldier sponsored ideas put into operation in the Fifth Army during the first quarter of this year.

Little Rock Air Force Base, Arkansas. A/1C Robert E. Barnes, 61st Strategic Reconnaissance Squadron, was a recent winner of a ten-spot for a quicker, more economical method of repairing B-47's. Instead of replacing the pilot and co-pilot aileron disconnect unit he found it could be filed at the base of the detent ring therefore making it operational. The suggestion was adopted throughout SAC after Headquarters, Air Materiel Command approval.

Utah General Depot, Ogden, Utah. For their suggestions to improve Government operations, 21 Utah General Depot employees recently were presented cash awards totaling \$670 and ranged from \$10 to \$130. According to William B. Howes, executive secretary, Incentive Awards Committee, first year savings to the Government are estimated at \$7,454.38. Top award of \$130 went to S.

LeRoy Fackrell, Depot Facilities Division.

Ford Motor Company, Detroit, Michigan. Here's a real winner in the award business. Mr. Gordon Childers won \$1,334.07 recently by suggesting an improvement in the method of installing the oil line in V-8 cylinder blocks. The real news—this is Childers' sixth award. Six winners from 10 suggestions submitted have earned him a total of \$5,882.50. Here's big business in the award area!

Ladd Air Force Base, Alaska. Seven Ladd civilian employees received over \$1,200 in cash for outstanding performances and money-saving suggestions recently. Colonel Charles W. Bicking, base commander, made the presentations.

Department of the Navy. Two Navy workers in Washington have received a record-setting award, of \$5,000 for a suggestion that is saving the Government an annual outlay of \$10-million. The money is being shared by Hobart McK. Griggs and Dennis Mitchell. \$5000 is the maximum that can be granted without approval of the Civil Service Commission. The idea for the suggestion occurred to Griggs in 1950 when he realized that freight rates paid by commercial firms for shipments of iron and steel items often were less than those paid by the Government. In 1953 he and Mitchell—working in their spare time—reviewed hundreds of bills of lading, gathered statistics, and met with commercial carriers and transportation representatives of other services. In 1955 the idea was adopted by the railroads and the services. In effect, it shifted the shipments of the defense items from high-cost "class" ratings into the lower cost bulk ratings enjoyed by commercial shippers.

Mather Air Force Base, California. Lt. Thomas C. Dobbins, 3535th Aircraft Observer Training Squadron, was recently presented with a letter of commendation in recognition of his work in developing a unique set of bombing tables. After more than a year of work on the project, Lt. Dobbins efforts are

designed to provide at-a-glance correction information to the Aircraft Observers when computers fail.

White Sands Proving Ground, New Mexico. Incentive Awards Program checks totaling \$1,370 were presented to 13 WSPG employees. It was the biggest single awarding in the history of the program at White Sands. Checks ranged from \$10 to \$300 and averaged \$105.38 each. Top winners were Donald Risinger, \$300 for suggesting a method of processing 16mm and 35mm reversal type color motion picture film in two stages, without the purchase of additional equipment costing \$85,000 and requiring 18 months for delivery, and Charles E. O'Meara \$300 for special telephone circuits.

Seattle Army Terminal, Seattle, Washington. Eight SAT employees recently shared a total of \$470 for five suggestions and two superior job performances. Kathryn M. Kavanaugh for the third consecutive year, received an Army Performance Award Certificate and \$200. She has been secretary to every commander of the terminal.

Naval Air Station, Alameda, California. In recent ceremonies more than 170 civilian employees were awarded \$26,900 for Beneficial Suggestions. The highest award of \$300 went to Clarence Russell, Jr., and Raymond F. Garcia for their suggestion, "Revisions of Aircraft Service Change 86, Section VII," which will save the Navy \$15,339 annually.

Headquarters Oakland Army Terminal, Oakland, California. A new "Hale and Hearty Club", which recognizes the conservation of sick leave and faithful performance of duty, has been launched at OAT. Colonel W. M. Gaige, Jr., Terminal Commander, presented certificates to 64 employees. A total of 149 workers, each with at least 1,000 hours of sick leave credits accumulated at the rate of 104 hours a year, were inducted as charter members.

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Sperry Rand Acquires 480 Acres in Phoenix

The acquisition of a 480-acre plant site, 15 miles north of Phoenix, Ariz., and plans for the immediate construction there of an aviation electronics plant were announced by the Sperry Rand Corporation.

Construction of an initial plant unit, between 75,000 and 100,000 square feet in area, will begin in September, Herbert C. Bostwick, Sperry Rand aviation division manager, said. Barring unforeseen construction difficulties, manufacturing operations will commence in the Spring.

The electronics company also plans construction later of a companion flight research unit at Phoenix's Sky Harbor Airport.

"The initial Arizona plant unit will represent an investment by Sperry Rand of more than \$2,500,000 in facilities designed to advance the all-around performance and safety of military and commercial aircraft," Mr. Bostwick said.



SERVICE SCHOOLS

DePaul University, Chicago, Illinois. Twenty-five Air Force Reserve Officers under the command of Colonel Ford M. Monroe, Chicago Air Reserve Center, participated in an experimental two weeks advanced management review course at DePaul University's College of Commerce. Their two week tour of active duty was entirely performed in the classrooms, laboratory and libraries of the university. Certificates of successful completion were distributed by the school's dean, Owen J. Quigley, C.M. The course materials were developed by Professors Kenneth K. Henning, Chairman of the Management Department; Thomas R. Masterson, Management Department, and William V. Haney, Communication Department.

Fort Rucker, Alabama. Mr. Guy Mallory, senior project engineer in the advanced design department of the Glen L. Martin Aircraft Corporation, participated in the Aviation School guest speaker program recently. Colonel John D. Edmunds, assistant commandant, introduced Mr. Mallory to the over-one thousand assembled pilots, instructors, aviation students and staff and faculty.

Randolph Air Force Base, Texas. Helicopter training is being expanded at Randolph with six classes being conducted concurrently. The first class of eighteen students were graduated recently, having begun training in July, with 38 hours in the H-13. This included 10 hours of pre-solo work and 25 hours of advanced operations. The H-19 phase of an additional 35 hours rounds out the program. Major John Miller is squadron commander of the 3514th Combat Crew Training Squadron, the training organization.

Rock Island Arsenal, Rock Island, Illinois. Having completed

four years of training, 22 Rock Island Arsenal graduating apprentices received diplomas recently from Colonel A. R. Cyr, Commanding Officer. Each graduating apprentice has completed 6720 hours of on-the-job training in his special trade, and 1280 hours of allied classroom study.

University of California. Graduation ceremonies were held recently for 60 civilian employees of 24 BuAer installations. The graduates completed six-week management training courses coordinated, administered and "hosted" by NAS Alameda and sponsored by the Bureau of Aeronautics. This year's program was enlarged in scope over previous years by the addition of a supply management course. Rear Admiral J. D. Ricketts, West Coast Supply Division inspector general, addressed the graduates.

Fort Monmouth, New Jersey. Signal Corps instructors at Service Schools throughout the Army assembled recently for the Second Army Signal Corps Instructor's Conference. The conference, which met with success during its inception at the Signal School last year, is designed to present the latest doctrine, techniques, equipment and current Army thinking to the Signal Corps instructors.

Navy Supply Depot, Great Lakes, Illinois. More than 50 conferees from the area served by the Great Lakes Navy Central Freight Control office gathered recently for a 5-day Freight Traffic seminar. The first three days of instruction were devoted to classroom study of carloading, loss and damage prevention and BuOrd policy on blocking and bracing of explosives and dangerous articles. Practical demonstrations occupied the fourth day of the seminar and the group watched demonstrations on loading fiberboard containers, use of

"K" braces and other bracing methods, loading ordnance material, carloading and impact tests.

United States Military Academy, West Point, New York. The new class of 1960, the largest to be admitted since 1950, contains 759 members. The presentation parade last week marked the acceptance of the new class as a part of the Corps of Cadets.

Laughlin Air Force Base, Texas. The fourth class of jet pilots 56-Q were graduated recently with Brigadier General Henry R. Spicer, USAF, making the graduation address. Comprised of 35 student officers who received their wings and 38 aviation cadets who received wings and commissions, the activities began with a wing review and aerial flyover.

Psychological Warfare School, Fort Bragg, North Carolina. A Special Forces officer orientation course has been established and designed to indoctrinate officers and civilians in Special Forces concept, doctrine, organization, operations, and techniques. The new classes are of one week's duration, and scheduled for September 10, October 8, November 5, 1956, and February 11, March 11, and June 3, 1957.

Philadelphia Quartermaster Depot, Philadelphia, Pennsylvania. Twenty officers recently completed a course at the Philadelphia Textile Institute. First of its kind, the course is designed to further military knowledge in the field of Textiles.

United States Coast Guard Academy, New London, Connecticut. The largest entering class in the history of the United States Coast Guard Academy, 262 Cadets, representing 34 states plus the District of Columbia, Canal Zone and Puerto Rico, were sworn in recently by the superintendent, Rear Admiral Raymond J. Mauerman. Ceremonies were held in front of Hamilton Hall and witnessed by members of the Academy staff and 26 recently commissioned ensigns from this year's graduating class who have been assigned the task

of receiving and indoctrinating the new class.

Quantico, Virginia. Colonel James L. Neefus, USMC, a veteran flyer, took command of the Marine Corps Schools Air Station recently relieving Colonel Avery R. Kier, who has been assigned to Fleet Marine Force, Pacific. Colonel Neefus, a native of New York, was graduated from the University of Florida and commissioned in 1936. He commanded a squadron at Midway Island in 1941.

Army Language School, Monterey, California. A ground-breaking ceremony for a \$1.8 million building program at the Army Language School recently opened the first phase of a 20-year master plan for this ever-growing institution which now teaches 28 languages.

The two new buildings to be constructed in the first phase are a \$1,201,082 student dormitory and a \$572,039 classroom building.

The first of two new classroom buildings scheduled for the master plan, the new academic facilities will contain such advanced training features as closed circuit TV in all classrooms, a radio broadcasting system for language instruction programs, and an ultra modern language laboratory that includes interpreting booths for simultaneous translations in four different languages.

The new student dormitory, also the first of two troop housing buildings scheduled for the 20-year plan, will house 440 men and have its own mess facilities. Fortunate students quartered in the new structure will have a panoramic view of Monterey Bay and the Pacific Ocean.

Eielson Air Force Base, Alaska. The Management Training Program was completed recently by eleven members of the command. Long leaders in training supervisors in better management, the Eielson school has graduated many students from their program.

Fort Dix, New Jersey. Colonel Robert E. Conine, USA, has been appointed G3, assistant chief of staff in charge of training at Fort Dix, succeeding Colonel Kenneth

C. Robertson, who has been selected to attend the Army War College. Colonel Conine who has held many important combat and tactical posts was an Infantry regimental commander at Fort Dix prior to his appointment.

Offutt Air Force Base, Nebraska. Forty members of Offutt's first OJT Supervisor-Administrator class were graduated recently with Colonel James H. S. Rasmussen, Deputy Director of Personnel, SAC, making the principal address.

Naval Postgraduate School, Monterey, California. Graduation exercises were held recently for the 173 members of the first class at the Naval Postgraduate general line school under the new 9½ month curriculum. Vice Admiral J. L. Holloway Jr., Chief of Naval Personnel, spoke to the class which included 143 male, 13 Wave and 17 foreign navy officers.

Big Army Artillery Shell Packs Punch

Washington (AFPS)—A 280-mm artillery shell with an atomic warhead will cause almost 50 per cent total destruction within the radius of one mile from the point of detonation.

This was revealed in a recent discussion of the comparative destructive power of conventional and atomic-armed shells by Rep. Craig Hosmer (R-Calif.) on the floor of the House.

Equivalent to 20,000 tons of high explosives, an 11" atomic artillery shell under normal conditions would have enough thermal heat to produce 50 per cent fatalities to those exposed "at ranges up to slightly more than a mile from the point of burst" the legislator disclosed.

In contrast, a typical 8" howitzer used in WWII had a destruction area of 20 to 80 yards and caused about 50 per cent casualties but not necessarily fatalities to those unprotected from its blast.

On this basis, it would take 2,000 155-mm artillery shells of the type effective from 18 to 60 yards during the Korean War to inflict half the damage in terms of casualties that one 280-mm atomic shell could produce, Mr. Hosmer said.

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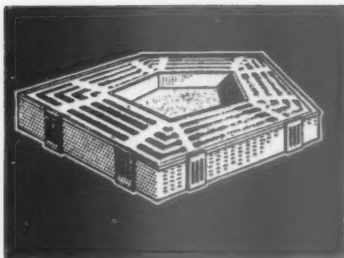
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Washington Management

Department of the Navy. One of the new guided-missile frigates authorized for construction in fiscal year 1956 will be named the USS KING, in honor of the late Fleet Admiral Ernest J. King. The keel of the KING will be laid sometime in 1957 at the Puget Sound Naval Shipyard. She will have an extreme beam of 50 feet, 512 feet in length and displace 3,900 tons. The KING will be equipped with TERRIER guided-missiles aft and 5-inch gun batteries forward.

Department of the Air Force. Secretary of the Air Force Donald A. Quarles presented the Distinguished Service Medal to Lieutenant General Hubert R. Harmon during the change in command ceremonies at the United States Air Force Academy. The presentation was the third occasion on which General Harmon has received this decoration.

Department of Defense. Properties and inventories with an aggregate value of \$135 billion were held by the military services on December 31, 1955, according to a report recently submitted to the President and Congress. This figure compares with an aggregate value of \$123 billion reported last year for December 31, 1954, the increase reflecting improved recording, reporting and summarizing procedures within the Defense Department.

Department of the Army. The future lexicon of the U.S. Army will reflect the term "Strategic Reserve" rather than "General Reserve," in referring to deployable active Army units located in the United States and Hawaii. The change in terminology is intended to provide a name that more accurately portrays an active force capable of strategic employment

and to describe the broad scope of operations for which the units are constituted.

Department of the Navy. A landing deceleration parachute, designed to help reduce rollout of the Navy's largest carrier-based bomber, the Douglas A3D SKYWARRIOR, is now being fitted to all production ASD aircraft. The husky 70,000-pound twin-jet bomber has low speed landing characteristics and a Hytrol non-skid braking system that will normally stop it in a short distance. The deceleration chute, which measures 24 feet in diameter, is intended for landing conditions on land only.

Department of Defense. Rear Admiral B. Hall Hanlon, Commander, Joint Task Force Seven, has returned from the Marshall Islands following the recent conclusion of the REDWING test series, and has made preliminary reports of the tests to Secretary of Defense Charles E. Wilson and Chairman Lewis L. Strauss of the Atomic Energy Commission. The Admiral reported that the programmed number of tests was made and consisted of nuclear devices ranging widely in yield, some in the kiloton and some in the megaton range.

Department of the Air Force. The Second Joint Military-Industry Packaging and Materials Handling Symposium will be held on October 9, 10 and 11 in the Department of Commerce auditorium, Washington, D.C. The Air Force is host this year for the participating agencies. The program for the first day sessions will include presentations on Future Handling for Air Cargo, Management Recognition of Packaging and Materials Handling, Amphibious Operations, Develop-

ments in Europe, Packaging and Handling for the Army of the Future, Utilization in Industry, and Mobile Support of the Fleet.

Department of the Army. Radar, the electronic eye that spots planes and catches speeders, has been put to use by the Army—measuring great distances for the surveyor. The "radar ruler," developed by the Army's Signal Corps Engineering Laboratories at Fort Monmouth, New Jersey, gives the surveyor 20-league boots. With the radar yardstick, the surveyor can measure off 50 miles with precision to a few feet.

Department of the Navy. Navy plans to use Hawaii sea areas as a major guided-missile training range will result in establishment of a target-drone and guided-missile facility at Bonham Air Force Base, Barking Sands, Kauai. The Air Force will retain ownership of the base, but has agreed to its use by the Navy. Year-round good weather of Kauai, about 110 miles from Pearl Harbor, was an important factor in the selection.

Department of Defense. The Defense Department in a new move to simplify paper work in the Armed Forces will standardize forms used in military supply operations.

All requesting, shipping, billing and receiving of materiel will be done on a single series of forms after Dec. 31, 1956, the Defense Department said.

The consolidation, which follows the recent establishment of the single manager system for food, clothing and medical supplies, was ordered when it became apparent that the lack of common supply forms impeded the furnishing of materiel by one service to another.

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Existing stocks of forms will be used until exhausted.

The "uniform documentation program" will ease the task of training thousands of military and civilian personnel, streamline supply operations and bring substantial savings by eliminating numerous forms used throughout the services, according to the DOD.

United States Coast Guard. Surveys of Coast Guard District aircraft needs are being made to come up with a long-range replacement program for over-age planes. Preliminary estimates seem to favor the use of more helicopters and a few less fixed-wing aircraft. Part of the question at the moment is whether to buy new planes or get replacements from the Navy and Air Force. Plans for the present fiscal year include replacing eight JRF's with helicopters.

Department of the Air Force. Approval has recently been given to reduce from seven to five the flight service centers in the United States. The March Air Force Base Center is expected to be closed within the next 30 days with the Hamilton Air Force Base Center being enlarged to cover this area. The Wright-Patterson Air Force Base and the Lowry Air Force Base Centers will be closed, with a new center planned in the middle of this area. Greater effectiveness with less personnel is expected.

Department of the Navy. During 1955, 135,200 acres of land and 1,468,365 acres of adjacent waters in the Aleutian Island chain of Alaska were relinquished by the Navy Department to the jurisdiction of the Department of the Interior. Rear Admiral Kenneth Craig, USN, Commandant, Seventeenth Naval District, stated that the return of these holdings was in accord with the Navy's policy of making such returns when it was ascertained that the land and adjacent waters were no longer required in the national security requirements.

Department of the Army. An \$1,800,000 contract has been awarded to Vertol Aircraft Corporation, Morton, Pennsylvania, to

modify and equip for the Army two standard H-21C Workhorse helicopters with gas turbine engines. Installation of the twin turbine power plants will give the helicopter advantages of multi-engine reliability, higher performance and an increase in all-weather capabilities.

Canadian Department of Defense. The \$170 million dollar mid-Canada radar warning line along the 55th parallel will be in operation on 1 January. Defense Production Minister C. D. Howe in explaining the system to the House of Commons estimated it will take approximately 800 civilian employees to operate the line.

Sapper Stalks on Air

Representatives of N.A.T.O. countries recently watched an annual demonstration of warfare techniques by Britain's Royal Engineers at Tidworth, Hampshire. Exercise included bridging, mine laying, demolition, mine deflection reconnaissance, and airfield construction.



Picture shows: During a display of mine detecting, a sapper of the Royal Engineers wears inflatable anti-mine shoes to reduce the pressure of his feet. They are blown up like a child's balloon.

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2. Easily moved signal	Y	10. Pocket with wire and acetate lug	Y
3. Protected pocket	Y	11. Pocket lug riding on rail	Y
4. Pocket tight to lug	Y	12. Frictionless shift of pockets	Y
5. Positive visibility	Y	13. Perfect layback of pockets	Y
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ics study of the cockpit arrangement and instrument display requirements for vertical take-off and landing aircraft has been awarded the Ryan Aeronautical Company, T. Claude Ryan, president, announced recently.

Ryan will produce a comprehensive report describing the optimum cockpit and instrument arrangement and will build a cockpit mock-up incorporating these recommendations.

The new contract, covering the most extensive investigation of its type ever undertaken, is the result of an Air Force competition won by Ryan. The company's capability in performing this work stems from years of VTOL research associated with the Air Force's Ryan X-13 Vertijet and with Navy research contracts in this same field.

Human engineering is engineering for human use. In cockpit design, it encompasses instrument display, controls arrangements, pilot seating and all of the complex factors which affect the efficiency of the man-machine relationship.



NEWS BRIEFS

from the

SERVICES

Wright Air Development Center, Dayton, Ohio. Colonel Joseph Davis, Jr., USAF, has been named Director of Flight and All-Weather Test, replacing Colonel Kenneth W. Schultz, USAF, who held the post since July 1954. Colonel Davis has been Assistant Director since March. He came to WADC from Headquarters ARDC where he was Chief of the Tactical Division. Colonel Schultz is the new Deputy Commander of the 12th Strategic Fighter Wing, SAC, at Bergstrom Air Force Base, Texas.

Headquarters Bay Area Terminal Center, Fort Mason, California. Brigadier General W. J. Deyo, Jr., has announced excellent results from the Army terminals of the Pacific Transportation Terminal Command operating under the Army Industrial Fund system. The major change in the financial management of the coastwide command began July 1. Under Army Industrial Funding a single lump sum is made available to a commander for operating his installation. The commander pays all costs, including labor, supplies and housekeeping, from this fund. In turn he bills the installation customers, in this case, other elements of the Army, the Air Force, the Navy and other federal agencies, for services rendered.

Headquarters Alaskan Air Command, APO 942, Seattle, Washington. A new high speed system permitting Alaskan Bases to order supplies much faster recently began operating in the Alaskan Air Command. The "IBM Data Transceiver System" reduces pipeline and transmission time and provides a more rapid method of sending punched card data from overseas bases to the Zone of the Interior. With the new system it is not uncommon for supplies to be on the way to the requesting organization the same day they are ordered.

Edwards Air Force Base, California. The "Flying Saucer" made its appearance recently in the form of a U. S. Navy WV-2 Super Constellation designed and built by the Lockheed Aircraft Corporation. A new saucer-shaped dome measuring more than 30 feet across, housing an experimental radar early warning installation was mounted atop the WV-2. Accustomed to weird things, personnel at the Test Center admitted doing a "double-take" on this one.

Marine Corps Air Station, Cherry Point, North Carolina. Twin stars, denoting the rank of major general, were affixed to the uniform of a popular veteran Leatherneck flier, John Calvin Munn, who commands the Second Marine Aircraft Wing. The general, a Marine pilot for 25 years, took command of the Wing last January. He had previously been Inspector General of the Marine Corps at Washington.

Naval Auxiliary Air Station, Barin Field, Foley, Alabama. Win-

ner of the contest to name the North American T-28C trainer is Lt. Thomas G. Harty, an instructor stationed at this installation. The name—"TROJAN"—has been officially selected in the contest sponsored by the Navy and North American Aviation, Incorporated.

Redstone Arsenal, Huntsville, Alabama. The largest static test stand for rocket motors in the United States, has been completed and is in use at this installation. The huge test facility, started two and one-half years ago and costing a total of \$12 million, is capable of testing the intermediate range ballistic missile now being developed at Redstone Arsenal by the Army Ballistic Missile Agency under command of Major General John B. Medaris. The test stand built of reinforced concrete, towers 145 feet high—as tall as a 15 story building, is only a part of the entire test facility.

Headquarters United States Coast Guard, Washington, D.C. Captain Emmet T. Calahan, for the past two years skipper of the cutter WACHUSETT, has relieved Captain Oliver A. Peterson as Chief of the Division of Information at Headquarters. Captain Peterson takes over as Chief of Staff, 9th District.

Brooklyn Army Terminal, Brooklyn, New York. The Budget and Review Division, Office of the Comptroller, has been redesignated the Budget and Cost Division. Mr. Max Nash who has been Chief of the Division since August 1954, continues in that capacity. Mr. Nash began his career with the Federal Government in January 1942, and is a staunch member of the Armed Forces Management Association.

USS Oriskany, Alameda, California. Under the command of Captain Charles L. Westhofen, USN, the carrier ORISKANY returned recently to her home port after six months from her fourth Far East tour. Dubbed by ComAir-Pac as the outstanding aircraft carrier serving in the Pacific, the coveted "E" for battle efficiency and the "E" for her engineering and

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The Assistant Inspector of Naval Material at Germantown, Pennsylvania has an opening for an Engineer in the development and production of ordnance equipment, such as; guided missiles, fuses, airborne bomb directors and other ordnance devices. The position involves correlation and evaluation of engineering data, for improving the reliability and quality of such equipment.

If you have a Bachelor's degree in engineering (or four years of experience equivalent to such a degree) and Two and one-half years of engineering experience, one of which has been in ordnance engineering, you can qualify for this position. A Master's degree in engineering may be substituted for one year of the experience required, while a Doctor's degree in ordnance engineering may be substituted for all of the required experience.

If you are interested in a position offering innumerable opportunities in the production and development of equipment for the U. S. Navy write to the Supervising Inspector of Naval Material, 17 Brief Avenue, Upper Darby, Pennsylvania for further information.

operations departments, The ORISKANY took three of the four awards given carriers of her class.

Chicago Administrative Center, Chicago 9, Illinois. This is the new designation for the former Chicago Quartermaster Purchasing Center, it was recently announced by Colonel Elmer A. Kell, Jr., commander of the Army installation. The Center has served continuously since its original establishment as a Purchasing and Commissary Depot in 1867. This is the second time within two years that the name has been changed to reflect the true mission of the organization.

Naval Air Station, Floyd Bennett Field, Brooklyn, New York. A silver jubilee luncheon commemorating the 25th anniversary of the installation was held recently at the station by the Flatlands Chamber of Commerce of Brooklyn. Mrs. Floyd Bennett, wife of the late Chief Warrant Floyd Bennett, after whom the field was named, was the guest of honor.

343d Fighter Group, Duluth Municipal Airport, Minnesota. Colonel Robert L. Gould, USAF, has assumed command of the 343d replacing Colonel George L. Hicks, USAF, who will attend the Air War College. Colonel Gould was formerly Director of Plans and Training at Central Air Defense Force, Grandview Air Force Base, Missouri.

Fort Meade, Maryland. An adapter that permits the firing of blank 10-gauge shotgun shells in 75mm salute guns will cut the annual cost of daily reveille and retreat formation more than 3500 per cent at 10 Second Army installations.

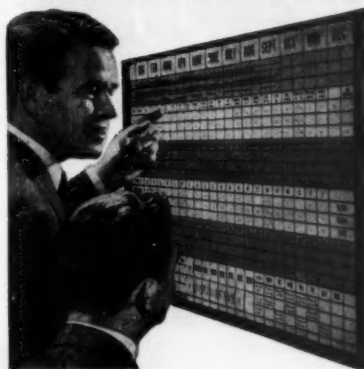
Dow Air Force Base, Maine. "Statistical Data for Management" is the name of a new pocket booklet which has been published by the Dow Management Analysis Office. Distributed to all squadron commanders and staff officers at the wing and group level, it becomes a ready reference for all personnel. The booklet was prepared by Mr. John Libbey, Management Analyst and S/Sgt. Richard E. Rowell.

Military Air Transport Service, Parks Air Force Base, California. The Pacific Division long headquartered at Hickham Air Force Base, Hawaii, is in the process of being moved to California. The move will bring all three MATS division headquarters within the continental limits of the United States. Rear Admiral Thomas B. Williamson, commanding the division announced the transfer will involve about 94 Air Force and 14 Navy Officers and 145 enlisted men and 120 civilian employees. The operating unit at Hickham will continue to function as at present.

Oak Harbor, Washington. Patrol Squadron 50 reactivated at the outbreak of the Korean War has been transferred to the Naval Air Station, Whidbey Island from Naval Air Station, Alameda, California. Assigned the newest Martin twin-engine flying boat, the squadron will fly out of the Seaplane Base seadrome, which has been reopened for support of a fully operational seaplane squadron.

Richmond Quartermaster Depot, Richmond 12, Virginia. Before a crowd of 2,000, Major General A. B. Denniston, The Deputy Quartermaster General, presented to the Richmond Quartermaster Depot the National Safety Council's Award of Honor. Received by Colonel C. F. Kearney, Commanding Officer, he expressed appreciation to all employees who were

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Novick



Fisher

The Role of Management Tools in Making Military Decisions

By David Novick and G. H. Fisher

MANAGEMENT problems are almost as old as human activity. When individual proprietorships and family companies were the principal types of business organization, the individuals who managed either had started the business or had come into the management by birth or marriage. Twentieth century growth of the corporation has changed this situation in at least two respects: first, the leadership can only in a few cases come from those who have lived the life of the enterprise; and second, the changes in size and variety of corporate activities have far outstripped the ability of any one individual to cope with all of

the problems of the large corporation.

In business this has led to a new phase in management. To the problems brought about by changes in technology which characterized the period prior to World War II, there now has been added the problem of organization and administration resulting from the expansion in size and scope of activities which has typified corporate growth in recent years. Scientific management, as it was practiced by Taylor and his followers with its emphasis on the steps to be taken to increase the productiveness of workers, was not adequate for this new set of problems which placed its emphasis on

the productiveness of management. In sum, whereas in the relatively small and simple company the management capability could for the most part be taken for granted and the problem was to improve production through the technological processes, in present day large and complex companies the technological capability of the component units can more or less be taken for granted and an increased return on corporate resources usually is to be found in improved management.

This has given a new importance to both organization structure and administrative techniques, with a growing emphasis on the kinds of decisions to be made at each level of management, the nature of the information required for making good decisions, and the machinery necessary for executing these decisions in large and complicated organizations. To assist in the decision-making processes, a new role has been given to operating statistics and statistical analysis of operating data as an adjunct to accounting information, and timeliness of information has assumed greater importance calling for newer and faster data processing equipment. The changes of the last decade or two are only the beginning. Each year an increased amount of time and effort is devoted to these new and emerging problems of management.

Although military management problems are not identical to those of large business corporations, they have many similarities. In the cold-war type of military operation, which has characterized the last ten years, and which seems to represent what we can expect for many years in the future, some of the major types of decision-making problems of management for the military seem likely to be very similar to those with which business is now struggling.

While the general types of problems of decision may be similar in both types of activity, they are likely to be considerably more complex in the case of the armed forces. In the first place, our military services are now larger than any of our corporations. Secondly, new weapon systems require that each service deal with a range and

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variety of equipment more complicated than those employed by even the largest companies. In addition, world-wide responsibilities now impose on our military departments a greater geographical distribution of control than any one business has ever assumed. And above all, the very nature of modern war makes timeliness of decision of even greater importance to the military than it is to business.

All of this means that in military management there is a real urgency for developing management tools which fit the realities of the current general military problem: that is, the problem of managing a peacetime force and doing it in a way which will maximize our potential wartime capability over time, subject to certain budget or resource constraints.

Management Decision-Making Processes

Management decisions are inherently difficult in either business or government. This is particularly true as the level of decision making moves upward from simple basic actions to the complex and integrated combinations of activities that mark the responsibilities of the higher levels of management. As the separate actions are combined and integrated, even the seemingly straightforward and simple decisions become complex because they can no longer be made separately and in isolation. Instead, the sets of actions must be examined in terms of their interdependent responsibilities and influence.

The universal problem of management becomes even more complex and difficult when applied to the military departments of the Federal Government. Just the size of the Army, Navy and Air Force in physical, organizational and financial terms is one reason for this. Another complicating factor is the relative newness of their major equipments, their present assignments and their current administrative responsibilities. Perhaps most important are the very difficult areas of prediction which mark most of the major decisions which must be made by the military organizations.

In a broad sense, the *over-all* or *total* management problem for the

military forces may be defined as: making decisions about a wide range of complicated activities, each set of which must be viewed not only in terms of its separate consequences, but also in terms of the combined and interrelated effects, and making these decisions for future situations and conditions which are extremely difficult to predict.

If it is agreed that this is the essence of the over-all military management problem, then the question arises as to how such decisions are to be made. One way is for decision makers to rely almost entirely on experience, intuition or judgment. Perhaps some management problems in the military departments may be tackled in this manner, but undoubtedly few men would be so bold as to recommend relying exclusively on intuition and judgment as a general basis for decision making in the armed forces. Most of the problems are just too complicated to permit intuitive answers. Thus various sorts of "management tools" must be used in the decision-making process. A wide variety of such tools is available: accounting, budgeting, statistical analysis, operations research, systems analysis, management evaluation schemes, industrial engineering techniques (work measurement, setting of standards, etc.), linear programming—to mention only a few.

Given this wide assortment of tools, the problem is to make the right choice of tools for each decision area. Unfortunately management tools are often introduced without first studying the nature of the management decisions to be made. The result is a mismatching of tools and decisions. Hence, the tools are being called upon to do things they cannot do.

Statement of the Problem

At present the Department of Defense places considerable emphasis on "financial management" as an aid to total or over-all management. Although much has been written on the subject during the past year or so, a precise definition of financial management is difficult to find. The Cooper Committee report contains a discussion on the "Concept of Financial Manage-

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ment,"* but a definition of the term is not given. However, from the contents of the report (budgeting, accounting, reporting, auditing) it seems clear that the Committee regards budgeting and accounting as the primary management "tools" involved in financial management. (Reporting and auditing may be related back to accounting.) In any event for purposes of discussion in the present paper, the term financial management will be assumed to mean the use of budgeting and accounting, in a broad sense, to help solve the over-all management problem as defined previously.

Now the question arises: What can budgeting and accounting contribute to over-all management (decision making) in the armed forces? Are these tools more useful in certain areas of decision making than in others? What other man-

*Financial Management in the Department of Defense, Advisory Committee on Fiscal Organization and Procedures, Office of the Secretary of Defense, October 1954, p. 8.

agement tools may be more appropriate in decision areas where budgeting and accounting are not very useful? What other tools may be used in conjunction with budgeting and accounting to improve decision making in certain areas? Questions such as these form the basis for much of the subject matter discussed below.

Some Major Theses

A fundamental thesis of this paper is that before we can consider the use of various management tools (budgeting, accounting, or anything else), we must first know something about the management decision-making areas to which the tools are to be applied. The sequence is, first get an understanding of the decision areas; then relate *all* of the available tools to the decision areas, trying to make sure that the tools selected are the most appropriate ones.

A subsidiary thesis is that in dealing with management problems in the armed forces, one must not assume, as is often done, that there is a close, "across the board" correspondence between management in private industry and management in the military realm. Of course some common ground exists between these two areas, but in general there are marked differences. For example, the motivations are different. There is no clear-cut profit motive in the armed forces. Also the "product" in most military operations is difficult to define in an operational sense. With motivations not clear-cut, with end products not explicitly defined, and hence with concepts of "efficiency" hard to come by—all of these factors combine to make it more difficult to formulate a concept of management control for the armed forces as compared with private industry. In sum, many of the management tools that work well in private industry may not be the most appropriate ones to use in the military; at least they may not apply with the same force or be as well suited as in private industry. All of this ties back to the basic starting point: the decision-making areas. In general the nature of decisions to be made by the armed forces are not the same as those required in private industry. The nature of mili-

tary decisions is discussed briefly later in this paper.

Another thesis, related to the first one stated above, is that financial management has one role to play in business and quite another one for the military. In either case it is only a *part of over-all management* and should be recognized as such. We must not attempt to make budgeting and accounting accomplish tasks they in fact cannot do. Also it must be kept in mind that while financial management in and of itself may not be particularly useful in certain areas of decision making, when combined with other management tools it may be used to considerable advantage.

Still another subsidiary thesis is that in attempting to set up management control devices (e.g., an accounting system) for the Army, Navy or Air Force, cognizance must be taken of the fact that each service is far from being a homogeneous organization as far as types of decision-making areas are concerned. For example, the management control problems, and hence the decisions to be made, in logistic activities are substantially different from those found in tactical operations. Thus, an accounting system appropriate for one type of activity in one service may not be suitable for another type of activity in the same service. Indeed, the general role of accounting as a management tool (as opposed to accounting in a fiduciary sense) may vary considerably throughout each of the services.

Along this same line, it is important to concentrate on areas where the potential payoff is greatest. For example, unless there are some special reasons, we probably should not advocate elaborate accounting systems for areas which cover only a very small fraction of the military budget, or where local managers, in view of Department of Defense and/or Army, Navy, and Air Force regulations and policies, do not have much flexibility in decision making.

The above "theses" may seem to be fairly simple. Yet many of them were for the most part ignored in the documents on financial management published in the Department of Defense during the past year or so. This belief provided

the principal stimulus for writing this paper. Since financial management is still in an evolutionary stage of development in the military services, a general discussion of financial management in relation to *over-all management* may be helpful. At least it is hoped that this will be the case.

Examples of violations of the "principles" are easy to cite. Before doing this, however, it should be made clear that such citations should not necessarily imply criticism of those who established the current financial management systems. Pressures from the Congress and other sources to get a "business-like accounting system" in the military and "get it in a hurry" were so heavy, and the magnitude of the task so great, that mistakes were bound to have been made. There probably was not time to carry out a careful and laborious investigation of the various decision-making areas, tie in financial management to other types of management tools, and design a financial management system to fit this context. In fact, in view of the circumstances, it is somewhat surprising that the present systems turned out as well as they have.

(Continued in October issue)

Johnson Appointed Borg Sales Manager

The appointment of Robert K. Johnson as Sales Manager for electronic components manufactured by the Borg Equipment Division of the George W. Borg Corporation, Janesville, Wisconsin, has just been announced by B. C. Booth, President of the Division.

Mr. Johnson succeeds N. W. Alexander who held the Sales Manager's post for the past five years until he left to form the Redford Corporation of Schenectady, New York. Mr. Alexander will act as Borg Equipment Division's factory representative in New York State.

Robert K. "Bob" Johnson is well qualified for his new assignment as he joined the Borg Equipment Division in 1951 as an electronic engineer. He worked in the Engineering Department until 1953 when he was transferred to Sales where he served as Assistant Sales Manager until his present promotion to Sales Manager.

Financial Management

(Continued from page 9)

general purpose, the Air Force, the National Guard, Mutual Defense Assistance Program, the Marines, and a special research and development project. From the point of view of supply management, it was not entirely satisfactory.

Now, as a simple example, we can immediately recognize the relationship of obligations to expenditures and take action to close the gap between obligations made and unliquidated obligations. With dollar data quickly available we were able to "manage" collections on MDAP obligations to our stock fund and reduce unliquidated obligations from over \$2 million to approximately \$69,000 in a period of three months. The results were obtained because we had the financial management tools to work with.

In reviewing the advantages I have cited, it can only be concluded that "financial management" is now and will become of even greater use in successful management of the Quarter Corps inventory.

My staff is aware of my constant interest in new and better procedures, improved administrative tools, and the analysis and development of gainful management techniques in the broad field of inventory management. In the normal course of their duties they enter into exchanges of ideas and concepts with individuals of other military staff offices and with personnel of many government agencies. They weigh the application of what industry is doing to gain efficiency. In short, we cannot afford nor do we wish to stand still in the everchanging methodology of progress. We have always taken pride in our willingness to adopt new and better ideas and to apply them to add to our ability, efficiency and the economy by which we supply and service the armed forces.

Electronic data processing is an up-and-coming scientific development, especially in the administrative field. Our adaptation of machinery, which will rapidly compute from the memory we establish and produce calculations in a

format immediately available for human digestion and studied decisions, is proceeding in earnest. At our newly organized Quartermaster Inventory Control Center at the Richmond Quartermaster Depot, we have set in operation an electronic data processing machine. Even now we are centralizing accountability of our depot inventories to take advantage of this machine's capabilities. But while we attack some of our current supply responsibilities using electronic data processing equipment, we are looking forward to progressing into allied functions which cover the range of all missions assigned to the Quartermaster Corps. Figure 4 will present the basic plan we have in mind for the utilization of electronic data processing.

Financial management of Quartermaster inventories will gain from the use of electronic data processing equipment. There is little doubt that the speed at which decisions can be soundly made to reflect supply and demand fluctuations will result in economy and, best of all, in meeting the needs of the soldier on time—in the right amounts—at the right place.

The devices of financial management which have been discussed appear costly. Certainly, as an example, electronic data processing machinery is a large capital investment. The development of trained personnel to man these devices may also appear costly. But weighed against the savings envisioned, the cost is no more than nominal and, in the long run, could be negligible in relation to the amount to be gained.

I firmly believe that the Quartermaster Corps is successfully applying financial management to its inventories. As a member of the Army team, the Corps shares with the other team members the burden of responsibility for obtaining the greatest amount of value from each defense dollar entrusted to it by the American people through the Congress. The Corps has made significant progress and is looking ahead to further advancement. We do not expect to nor can we, rest on our laurels. Our inventories are maintained to support the soldier. We have a sacred trust to manage supplies for the men and women of the armed forces with fullest integrity and greatest economy.

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Use of Manpower

(Continued from page 15)

In addition to our various standards and test development efforts, there are two specific programs worthy of mention which are designed to improve the long-run quality of our work force. One is the program to attract young, capable college graduates into all echelons of organization. Present schedules call for the employment of over a thousand such personnel annually. College graduate recruitment is supplemented by an extensive college cooperative training program. Under this system, college students training in fields directly related to AMC occupations are hired during alternate semesters as a means both of utilizing their developing knowledges and of orienting them to the AMC mission and organization. We have been successful to a considerable degree in retaining in the AMC employ such cooperative students following their graduation.

A second and equally important program is the apprentice training program for technical skills development. Many of the skills utilized by the AMC (for example, aircraft electricians) are not readily available in the labor market, but we have been eminently successful in developing these skills through the apprenticeship technique. Apprenticeship courses are usually four or five years in length, and during this period of time the apprentice is contributing proportionately greater amounts of his work time to actual production. At present there are approximately 1600 apprentices enrolled in the AMC program.

Beyond the objective of filling jobs with personnel of good success potential, our next major concern in the general area of manpower utilization is to assure ourselves that we are actually obtaining maximum benefit in the work situation from the skills and abilities possessed by our employees. This involves continuous surveillance of individual job performance, but even here, however, the process does not stop, since an integral part of the skills utilization process is the process of continuous development of skills.

The mechanical means for assur-

ing proper skills utilization is the skills locator system maintained at each AMC base. A special device is provided to "red flag" those cases where the employee's highest skills are not being utilized on the job. These situations are corrected as soon as it is possible to assign the employee to a position where the application of his highest skills is possible.

The most productive efforts in the direction of better manpower utilization, we feel, must stem from the first-line supervisor. Although the surface has only been scratched in the study of human motivation, we do feel that there are some few things that a supervisor should or should not do in this area. For example, it is difficult to imagine an employee who would not respond in a positive manner to fair treatment from his supervisor. Conversely, it would be equally difficult to conceive of an employee who would not react negatively to a publicly given reprimand from his supervisor. Our supervisory development programs are, therefore, designed to inculcate in supervisors and prospective supervisors certain fundamental concepts of supervision and operation which universally have seemed to be successful in practice. As a minimum, we want to indoctrinate our supervisors with the point of view that an employee improperly treated will not be fully productive, regardless of the level of his abilities or his prior attainments. Thus, poor supervisory practices can and do effectively negate the production potential of many an employee. Training of supervisors within AMC is conducted both through specialized programs designed to meet particular supervisory situations and deficiencies and through standardized courses which are pre-requisite for occupancy of supervisory positions. The standardized courses are designed and differentiated to meet the peculiar requirements of the various levels of supervision, such as (1) the part-time or working supervisor, (2) the first and second line supervisor, and (3) the middle-management supervisor.

We feel that an important aspect of supervisory training and particularly executive development (which

is discussed hereafter) is job rotation. In addition to augmenting supervisory and technical skills, the rotation process imbues supervisors with a broad understanding and appreciation of the many-sided problems of the Command. Increasingly, many of our key supervisors are being "rotated" to overseas positions where there is a particular need for competent personnel in the logistics field.

One business-like practice pertinent to this discussion which we encourage our supervisors to follow is that of developing and applying standards of performance for individual employees. For many jobs, both in Government and industry, there is no measurable quantum of production, such as numbers of parts machined within a given period of time. Where production cannot be measured or costed in specific terms, it becomes more difficult to assess employee productivity. It does not necessarily follow in our opinion, that productivity of such employees cannot be measured at all. As a matter of fact, an adequate measure is provided with the standard of performance. With this method, the employee position description is broken down into its most elementary parts, i.e., into distinct duties. For each duty, the supervisor establishes a standard of quantity (if possible) or, at least, of quality and timeliness. More specifically stated, the supervisor indicates for each duty "how much," "how well" or "within what time." The extent to which performance standards can be developed and effectively used, even for administrative and planning-type jobs is often surprising. We urge our supervisors to discuss the performance standard with the employee during and following the development process. Moreover, the standard, to be effective, must be reasonable in the eyes of the employee as well as in the eyes of the supervisor. The payoff occurs during periodic discussions with the employee. Here, actual, day-to-day job performance, as observed by the supervisor, is compared with the previously agreed-upon standard of performance.

Increasingly, students and practitioners of human relations are

coming to realize that both productivity and esprit de corps are enhanced through democratic leadership techniques and the encouraging of employee and group participation in the solution of management problems. AMC policy provides for the establishment of an advisory group or council of civilian employees at each base or station. The advice of these groups or councils is sought by commanders on many management problems.

Perhaps the most extensive participation of employees is secured through the suggestions program. Our efforts in this program area have been rewarded by annual employee participation rate of 30% (number of suggestions received during a period divided by the average number of employees on the rolls during the same period). The savings resulting from employee suggestions in AMC are conservatively estimated at \$18,000,000 annually.

One of the most urgently felt needs of Government, as is the case with private industry, is the need for highly competent top managers. Outstanding managerial talents are a must in an organization of the size and complexity of the Air Materiel Command. For this reason we have, for several years past, given careful attention to the development of executive talents. An interesting and comprehensive article on one executive development program within AMC, by Major General Thetus C. Odom, Commander, San Antonio Air Materiel Area, San Antonio, Texas, appeared in the Winter (1956) issue of the Public Administration Review. Programs of similar scope are in effect at most other AMC stations. It is our belief that the keys to successful executive development are fourfold:

- (1) development of specific requirements or standards to be met by personnel in executive positions.
- (2) appraisal of present and potential incumbents of executive positions to determine the extent to which they meet or approximate the desired, previously established requirements or standards.

(3) vigorous and continuous training and development of designated personnel to the levels specified by the standards.

(4) frequent reappraisals of individual progress and development.

The foregoing has outlined in a very brief fashion the most important programs that we have developed to improve the utilization of civilian manpower within the Air Materiel Command. Although much remains to be done, we feel that much of a tangible nature has already been accomplished. Not the least of the important consequences of our endeavors has been the building of a better esprit de corps among the work force. We have found that people's desire to work and cooperate bears a direct relationship to the effectiveness with which their skills are used and the

extent to which they are made to feel that they have a place in the organization. In fact, one of the most important goals for which personnel management in the Air Materiel Command strives is pride by each member of the Command in himself and in his job—a pride that stimulates career improvement and prestige winning job performance.

Locating and Developing

(Continued from page 18)

consequences of the way in which our scientists and technicians respond to the job satisfactions that can affect the rest. The time has long since passed when any of us who are responsible for researchers can afford to do less than the most careful appraisal of individual scientists in terms of their personality make-up. Most scientists will not ask for the world on a platter as a prerequisite for their doing



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their professional best. But all scientists because of their very nature, will deeply rebel if they are asked to do work that does not enable them to find as much satisfaction as they feel they have a right to reasonably expect. Neither will they enjoy being forced into an industrial research laboratory "mould" that prevents them from gaining adequate self-expression through their daily endeavors.

Law Increases Pay Of Defense Leaders

Top Pentagon officials received salary increases recently ranging from \$2,500 to \$5,000.

The biggest increases go to the nine Assistant Secretaries of Defense, and the Under and Assistant Secretaries of the Army, Navy and Air Force. Each will receive \$20,000 annually (they now get \$15,000).

Here are the present salaries of members of the Defense Department secretariat and the salaries they will receive under the terms of Public Law 854 which was approved by the President on 31 July. The measure went into effect at 5:10 p.m. on that date.

Official	Old	New
Defense Secretary	\$22,500	\$25,000
Deputy Defense Secretary	20,000	22,500
Asst. Sec. of Defense (9)	15,000	20,000
General Counsel	-----	19,000
Army-Navy-Air Force		
Secretary (3)	\$18,000	\$22,000
Under Secretary (3)	15,000	20,000
Asst. Secretary (12)	15,000	20,000

In addition, the new law authorizes the Secretary of Defense to establish up to 120 scientific and professional positions (only 45 are now authorized) in the Pentagon, and up to 25 positions in the National Security agency to carry out research and development functions relating to national defense and military and naval medicine with salaries ranging from \$12,500 to \$19,000. The range has been \$10,000 to \$15,000.

Top salaries in GS-17 and GS-18 jobs in the General Schedule contained in section 603(b) of the Classification Act of 1949 also were

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boosted to \$14,835 and \$16,000, respectively.

DEPARTMENT OF DEFENSE CHANGES

The Department of Defense recently announced plans to consolidate under the Commander-in-Chief, Pacific, with headquarters located in Hawaii, the areas and responsibilities of the Commander-in-Chief, Pacific, and the Commander-in-Chief, Far East Command. The change will simplify the command and organization of U. S. forces in the Pacific-Far East area.

The United Nations Command will be retained as a separate major command because of the unresolved politico-military situation which has resulted only in a suspension of hostilities and a state of truce. The headquarters of the United Nations Command, presently in Tokyo will be relocated in Korea. The U. S. support of United Nations forces in Korea will become the responsibility of the Commander-in-Chief, Pacific.

To carry out the functions and operations of U. S. forces in Japan an appropriate U. S. headquarters

will remain in Tokyo functioning under the command of the Commander-in-Chief, Pacific, in accordance with the Security Treaty and in cooperation with Japan's Self Defense Forces.

Other actions stemming from this basic decision will be worked out carefully and deliberately during the period. No major changes in the deployment of U. S. armed forces in this area are contemplated as a result of this action.

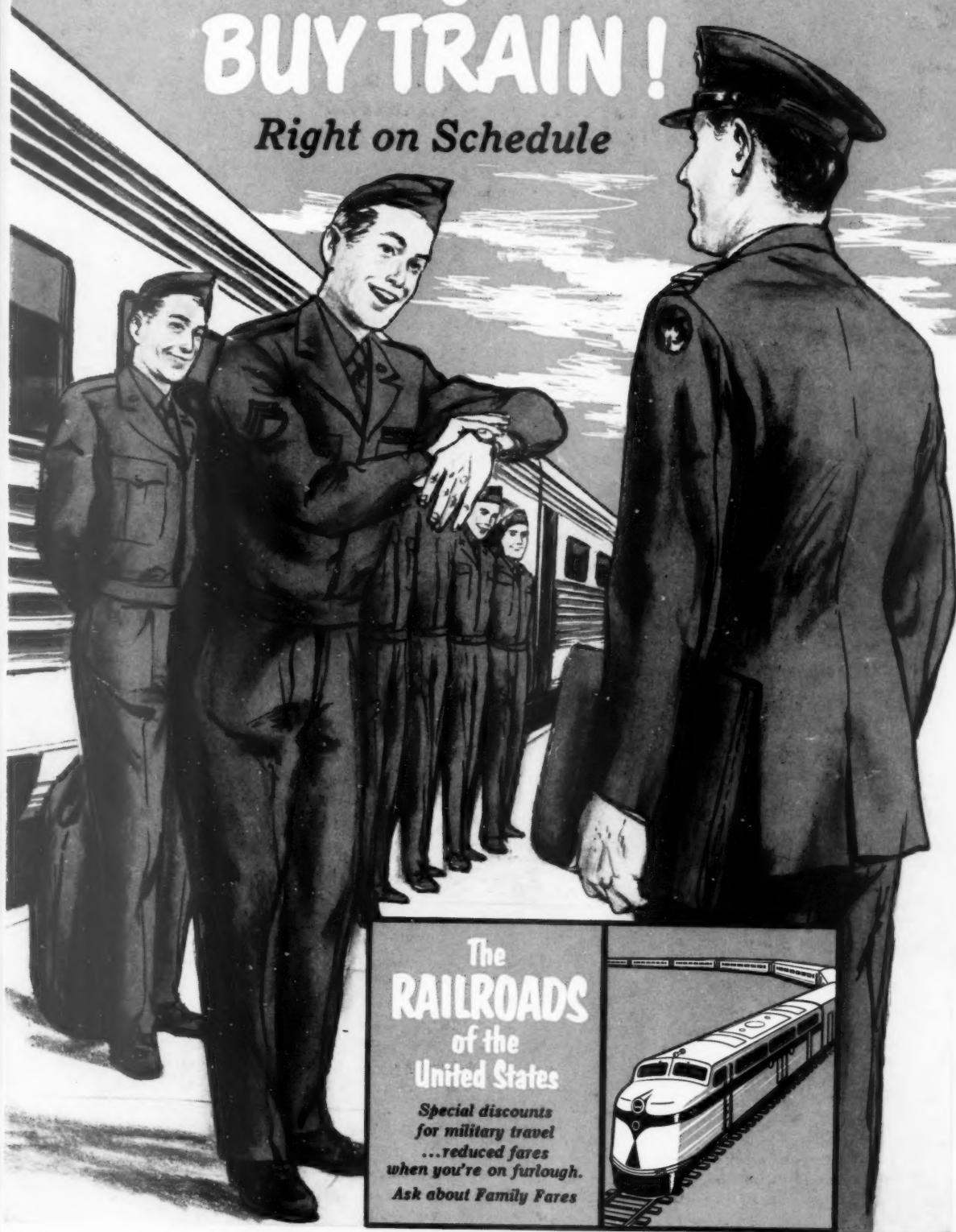
U. S. Northeast Command will be disestablished on September 1, 1956, and air defense responsibility for the Northeast will be assigned to Commander-in-Chief, Continental Air Defense Command.

Air defense responsibility for Alaska will also be assigned to the Commander-in-Chief, Continental Air Defense Command, and protection of Alaska sea communications will be assigned to Commander-in-Chief, Pacific.

U. S. Commander-in-Chief Europe's command will be substantially unchanged. However, U. S. Air Forces Europe had its residual specified command function of Alaska sea communications mander-in-Chief Europe on July 1, 1956.

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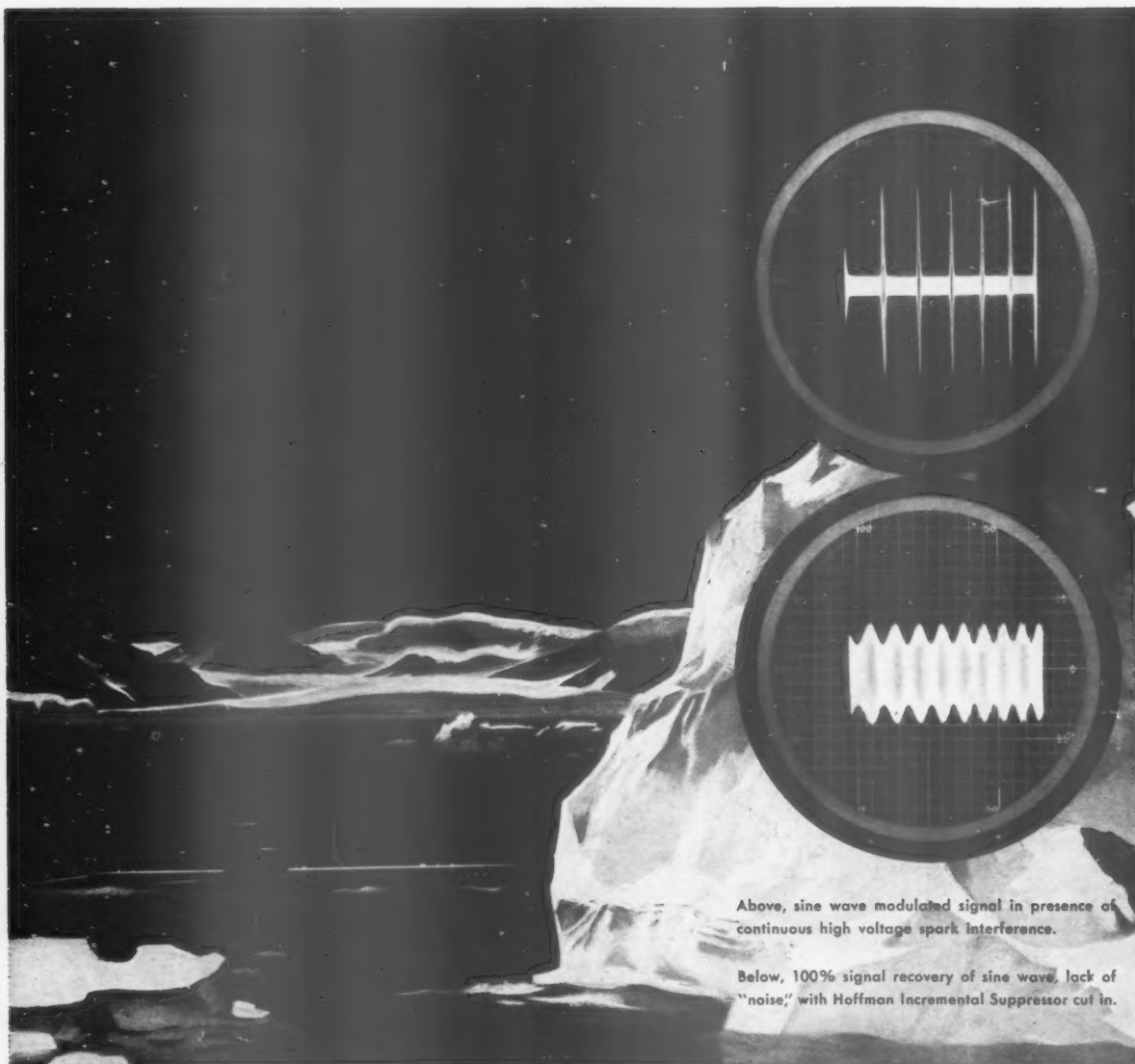
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